Making Earth, Making Home: Technoscientific Citizenship and Ecological Domesticity in an Age of Limits

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MAKING EARTH, MAKING HOME: TECHNOSCIENTIFIC CITIZENSHIP AND ECOLOGICAL

DOMESTICITY IN AN AGE OF LIMITS

By

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In the post-WWII era, concerns over Earth’s finite resources and technology’s destructive capacity shaped ideas of a global environment. This dissertation focuses on transnational grassroots social movements that attempted to find solutions to earthly vulnerability. It looks at women’s nuclear disarmament campaigns in the early 1960s, the Appropriate Technology movement of the 1970s, Canada’s conservener society program, and the emergence of feminist technoscientific critique and ecological activism in the early 1980s. In each case study, it shows how the ability to critique and produce technoscientific knowledge expanded women’s political identities, what I call technoscientific citizenship. Simultaneously, these groups promoted ecological domesticity, or the construction of white, middle-class, heteronormative domesticity as the correct way to care for a threatened earth. The tension between technoscientific citizenship and the privatization of care as represented in ecological domesticity forms the core of this work.

The dissertation begins with a study of the Voice of Women’s anti-radiation activism, arguing that these women produced technoscientific knowledge for political ends. It then turns to the Appropriate Technology movement, which advocated for small-scale, ecologically-benign, participatory technologies. Women in AT claimed technoscientific acumen and formed activist communities to support their political work. At the same time, AT promoted its work through gendered images that reified white, heteronormative, middle-class domesticity. This construction
of home facilitated the spread of ecological living into mainstream culture and assured people that inviting nature into homes would not overturn existing gendered social hierarchies. Black feminists, however, critiqued this construction of domestic care. Finally, it turns to feminist technoscientific critiques of AT and the emergence of ecofeminism, ending with a discussion of the Women and Life on Earth Conference. By linking the construction of specific kinds of homes to women’s expanding political power, this dissertation complicates conventional narratives of both feminism and environmentalism. Throughout, it blurs the boundaries between earth and home, feminism and environmentalism, ecology and technology. It asks how women’s political power can expand at the same time as it is limited by the continuation of specific domestic ideologies.
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TABLE OF CONTENTS

ACKNOWLEDGEMENTS .................................................................................................................. iii

LIST OF FIGURES .......................................................................................................................... viii

Chapter

1. INTRODUCTION: MAKING EARTH, MAKING HOME ......................................................... 1
   Earth, Citizenship, Home ............................................................................................................ 4
   Technoscientific Activists ........................................................................................................ 11
   Chapter Outline ......................................................................................................................... 17

2. “AS DEVOID OF EMOTIONALISM AS POSSIBLE”: COLD WAR
   DOMESTICITY AND WOMEN’S TECHNOSCIENTIFIC CITIZENSHIP ......................... 21
   Cold War Domesticity and Women’s Citizenship ................................................................. 23
   The Voice of Women’s Radiation Brief .................................................................................. 27
   Women Strike for Peace, Race, and Women’s Difference .................................................... 42
   Conclusions and Beginnings: Reworkings of Cold War Domesticity in Counter-Conduct Technology Movements ............................................................. 45

3. “AN EARTH ETHIC MAY WELL HAVE TO BEGIN WHERE WE LIVE”:
   TECHNOSCIENTIFIC CITIZENSHIP AND ECOLOGICAL DOMESTICITY IN
   APPROPRIATE TECHNOLOGY ............................................................................................... 48
   “Tired of Watching the Erosion of Life, Natural Resources and the Economy”:
   Emergence of Appropriate Technology ................................................................................ 53
   Technoscientific Citizenship and Ecological Domesticity ..................................................... 59
   Gender and AT ......................................................................................................................... 66
   Conclusions ............................................................................................................................... 73
4. “THE WOMEN THING WAS TERRIBLY IMPORTANT”: WOMEN’S PARTICIPATION IN APPROPRIATE TECHNOLOGY ORGANIZATIONS ..............76

“We So Thought, All of Us, That We Would Change the World”: Women’s Lives Before AT .........................................................................................................................79

“A Chance to Develop Ourselves”: Political and Economic Equality in AT Organizations .............................................................................................................................87

“Strong Mothers” and “Women Isolated at Home with the Children”: Women’s Domestic Labor in AT .............................................................................................................93

“Articulate Our Frustration”: Emerging Feminisms .................................................................................................................................97

Conclusions.........................................................................................................................................................................................100

5. “SPACE AGE ARK, BRAVE NEW HOME”: MAKING ECOLOGICAL DOMESTICITY MAINSTREAM .................................................................102

Alchemical Beginnings ......................................................................................................................................................................104

Science and Society at New Alchemy ..............................................................................................................................................107

NAI’s Cultivation of Counter-Cultural Networks ..........................................................................................................................116

Capitalizing “The World in Miniature”: The New Alchemists and Mainstream Funding ......................................................................................................................120

“Space Age Ark, Brave New Home”: Gendered Discourses of the PEI Ark .................................................................................................129

“NAI Must Become Economically Viable”...............................................................................................................................................137

Conclusions.........................................................................................................................................................................................141

6. “WASTE: THE NEW PORNOGRAPHY”: CITIZENSHIP AND GENDER IN CANADA’S CONSERVER SOCIETY ........................................................................144

“We May Make People Homeless”: The Voice of Women’s Technoscientific Citizenship..................................................................................................................................147

“Free Canadians for Action”: The Conserver Society Goals .........................................................................................................................151
``Democracy Will Lose Ground and Meaning”: The Politics of Writing Technoscientific Reports .................................................................157


Conclusions..................................................................................................................170


“Something Due”: Feminisms and Technological Critique.......................................175


“a) Racist, b) Heterosexist …”: Breaking on the Shoals of Difference.........................194

Conclusions: “Technology is Controlled by Politics” ..............................................197

8. CONCLUSION: TECHNOSCIENTIFIC CITIZENSHIP OR ECOLOGICAL DOMESTICITY ..................................................................................201

ORAL HISTORY INTERVIEWS AND ARCHIVAL SOURCES................................208

BIBLIOGRAPHY...........................................................................................................210

BIOGRAPHY OF THE AUTHOR..............................................................................228
LIST OF FIGURES

Figure 1. Brochure Promoting the VOW Baby Tooth Survey .............................................36
Figure 2. Fallout Graphs by Ursula Franklin .................................................................36
Figure 3. “Another Way” .................................................................................................51
Figure 4. The New Alchemy Dome ..................................................................................64
Figure 5. Diagram of Energy Flows Through Shelters .....................................................66
Figure 6. Women at Work in Appropriate Technology .....................................................67
Figure 7. An Androgyne Representing the Balance of Feminine and Masculine Principles..................................................................................................................68
Figure 8. Men and Children at NAI..................................................................................69
Figure 9. The Integral Urban House ..................................................................................71
Figure 10. Earle Barnhart Attempting Solar Alchemy ......................................................72
Figure 11. Hilde Maingay Counting Cabbage Loupers.....................................................92
Figure 12. The New Alchemy Kitchen................................................................................95
Figure 13. Nancy Jack Todd Harvests Wheat ..................................................................112
Figure 14. The New Alchemy Bioshelter .......................................................................114
Figure 15. Nancy Willis at Home in the PEI Ark .............................................................130
Figure 16. The Ark’s Kitchen ..........................................................................................133
Figure 17. Nancy Willis Hands a Child a Tomato ............................................................134
Figure 18. Home as Imagined in Conserver Society Notes ............................................163
Figure 19. Cover of Women’s Collective Issue of Science for People ..........................179
Figure 20. Women’s Pentagon Action Poster ..................................................................198
CHAPTER 1

INTRODUCTION: MAKING EARTH, MAKING HOME

In the early 1960s, the Voice of Women, a Canadian disarmament group, presented a “radiation brief” to the Canadian federal government. Written by the physicist Ursula Franklin, it detailed the health threats of nuclear radiation and insisted that the government provide data so that women could act to protect their homes and children. This work constructed a world described by deadly flows of radioactive fallout, what the anthropologist Joseph Masco calls the “Age of Fallout.”1 Less than a decade later, Nancy Jack Todd co-founded the New Alchemy Institute, an Appropriate Technology (AT) group that intended to “Restore the Lands, Protect the Seas, and Inform the Earth’s Stewards.”2 In AT activism, growing population, polluted seas, degraded agricultural lands, and scarce resources joined radioactive fallout in shaping images of a finite, interconnected planet. To protect the earth, Jack Todd and others suggested that “an earth ethic may well have to begin where we live. If this is so, our houses should emulate the workings of nature.”3 In 1980, women gathered at the “Women and Life on Earth” conference to discuss the relationship between feminism and ecological activism. At this conference, Ynestra King declared that for feminists, ecology was “a political word – that it stands against the economics of the destroyers and the pathology of racist hatred. It’s a way of being, which understands that there are connections between all living things and that indeed we women are the fact and flesh of connectedness.”4 Spread across two decades, all of these activist women shared common concerns: to protect a finite planet from humans’ “ability to destroy all organic

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2 This slogan became the masthead for the *Journal of the New Alchemists*.
life”\(^5\) and to expand women’s political power to critique technological change and construct technoscientific knowledge.

This dissertation traces the co-production of technoscientific citizenship and ecological domesticity intended to care for a limited, threatened earth.\(^6\) In it, I make two interrelated arguments. First, that women claimed the political power inherent in constructing and critiquing technoscientific knowledge and second, that care for the earth through personal domestic practices – a form of privatization rather than political engagement – formed alongside this proliferation of political identities. Science and technology had come, over the 20\(^{th}\) century, to be expert-led and politically powerful; as the historian Timothy Mitchell suggests, political power rests, in part, “on the forces of nature on whose behalf one can then speak.”\(^7\) Activists such as Franklin and Jack Todd insisted that technological decisions and scientific knowledge should not be the purview of the few but the many. In disarmament campaigns, ecological design groups, and in feminist collectives, women claimed the ability to speak for nature and for technology.\(^8\) They assumed forms of technoscientific citizenship, insisting that they, too, should be part of such political debates, that they should be able to construct technoscientific knowledge, and that they should be able to voice their concerns in the public sphere.\(^9\)

\(^6\) I draw on Sheila Jasanoff’s use of “co-production,” in which she argues that “the realities of human experience emerge as the joint achievements of scientific, technical and social enterprise: science and society, in a word, are co-produced, each underwriting the other’s existence.” Sheila Jasanoff, “Ordering Knowledge, Ordering Society,” in *States of Knowledge: The Co-Production of Science and Social Order*, ed. Sheila Jasanoff (New York: Routledge, 2004), 17.
\(^8\) Lorraine Daston and Peter Galison argue that “nature, knowledge, the knower intersect” in the formation of objectivity. Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), 53. This relationship, between knowing nature and speaking for nature, is inherently political. As Sheila Jasanoff argues, “it is through systemic engagement with the natural world and the manufactured, physical environment that modern polities define and refine the meanings of citizenship and civic responsibility ... the boundaries of the public and the private.” Jasanoff, “Ordering Knowledge,” 14.
\(^9\) For scholars of science and technology, technoscience implies the interlinking of scientific knowledge production and technological practices. For two recent articles that link technoscience to energy and the politics of care, see
Technoscientific citizenship takes two forms in this work: a person assuming the power to produce technological and scientific knowledge, and their ability to demand government responsibility for the care of its citizens through technoscientific critique. Women’s assumption of technoscientific citizenship could take shape because of the ways governance in the 20th century turned increasingly toward technocratic governance and, therefore, the political power inherent in producing rational, expert knowledge. Yet women’s technoscientific citizenship stood at odds to the dominant forms of expert-led governance, as women have been culturally, socially, and politically categorized as unreliable witnesses.10 Women’s assumption of technoscientific citizenship did not rely on an easy transferal of femininity or claims to women’s essential nature to the production of technoscience. These activists built identities that included these but were not limited to them. They also insisted on bringing a variety of concerns into the public sphere, making political such things as the right to reproductive safety or de-militarization of everyday life.

I also suggest that these same women were part of constructing what I call ecological domesticity: the social construction of domestic practices as the correct way to care for a threatened earth. For at the same time as women claimed the political power inherent in constructing technoscientific knowledge, homes came to be sites for managing a limited, fragile earth. In particular, white, middle-class, heteronormative domestic practices were linked to

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10 Many feminist science studies scholars have discussed the centrality of witnessing to the production of objective knowledge. For instance, see Michelle Murphy, Seizing the Means of Reproduction: Entanglements of Feminism, Health, and Technoscience (Durham: Duke University Press, 2012). Historians have also discussed the centrality of women’s witnessing in their legal citizenship, arguing that the ability to be seen as reliable witnesses in court is essential to their citizenship. For one instance, see Hannah Rosen, Terror in the Heart of Freedom: Citizenship, Sexual Violence, and the Meaning of Race in the Postemancipation South (Chapel Hill: University of North Carolina Press, 2009).
ecological well-being and, through this, to national economic security. By embracing specific practices of domesticity and connecting them to preserving natural and national orders, care for the earth became depoliticized, removed from public discussion to the seemingly natural space of the home. The women this dissertation focuses on, however, faced critiques from other women. Black women rejected the ecological domesticity that rested on white, middle class, heteronormative ideals, highlighting the fact that the full diversity of homes and bodies were not fully accounted for in white women’s protection of “life on earth.”

The activists I discuss wanted to change a world that was full of border crossings: between the public and the private, the technological and the ecological. They critiqued human technologies and the ways they mimicked ecological processes, posing threats to all life on earth. They welcomed nature into their own homes, imagining that houses based on ecosystem dynamics would be less destructive. They envisioned planetary preservation through private acts of consumption and production, taking personal responsibility through daily practices to care for the earth. At the same time, they were worried about ecosystem destruction, human health, and a political system poorly equipped to accommodate participatory citizenship, and so they turned to other forms of material political activism. Women in these groups constructed new political identities, refusing the private sphere for political engagement. I suggest that these activists were not only reacting to earthly devastation but also participating in the creation of new ideas of the earth. Throughout these decades, the space of the home was essential to constructing the space of the earth, and private practices took shape alongside radical political action.

Earth, Citizenship, Home

Many historians focus on the ways a “global environment” was constructed as a political object through novel visualization technologies, United Nations conferences, or international
scientific networks. In 1966, cybernetician Kenneth Boulding coined the term “Spaceship Earth” to invoke both the limited space of the earth and the necessity of human management.\(^\text{11}\) This planetary imagery was soon joined by the iconic “Earthrise” photos of the Apollo missions and, in the 1970s, a torrent of publications and conferences that solidified the “earth” as a political concern.\(^\text{12}\) Decolonization fueled worries of resource depletion, as the powerful North faced “increasing sovereign control by Third World countries over their natural resources.”\(^\text{13}\) In fact, Perrin Selcer argues that decolonization “was the central geopolitical dynamic structuring the meaning of the global environment.”\(^\text{14}\) Public discourse was concerned with human bodies (population), human dwellings (urbanization), and their relation to a global, limited ecosystem. In dealing with such relationships, international meetings helped instate a novel object of

governance: a unified, limited earth comprised of the relationships between human and biological systems. Historians have argued that this view of a closed, yet relational, earth paved the way for new forms of top-down, techno-scientific management that categorized certain places and peoples as more worthy of life or protection. In contrast, I look at grassroots organizations and individuals to show that they, too, both shaped and were shaped by ideas of a “whole earth.”

Additionally, gender is not usually included in these discussions except in relation to population control. As feminist scholars have shown, managing a finite earth required management of women’s reproduction, making certain people less worthy of life. I build on this literature by looking at individuals and organizations who attempted to alter domestic

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practices to care for the earth. I suggest that the ways people used resources became a form of
gendered governance. In this, I build on scholarship that shows the home and family were crucial
sites of Cold War politics.¹⁷

Not only were these individuals looking to “live lightly on the earth,” in poet Gary
Snyder’s well-worn phrase, but they were also claiming the power to produce technoscientific
knowledge and critique the impact of technologies on a shared world. By looking at these
grassroots organizations through the lens of home and technoscience, I add several aspects to
current literature. I attend to spaces not usually seen as part of the formation of the global
environment (the home); I add another realm of gender analysis beyond that of population; and I
contend that grassroots organizations were not only responding to earthly devastation but part of
shaping the “whole earth” as well. This technoscientific citizenship joined ecological domesticity
in the grassroots activism I attend to here.

In my discussion of citizenship, I draw on recent scholarship that has suggested that we
need to understand what kind of citizens are created through scientific practices and how science
itself is shaped by ideas of citizenship. As Aya Kimura asks, “What kind of citizen is implied in
citizen science in a specific historical context? How does the gendered nature of civil society
influence the politicization of citizen science?”¹⁸ The people I discuss were creating not only
novel forms of participatory science but making political claims through their work. In this, I
expand on feminist science scholars who suggest that people’s practices form specific political

¹⁷ Tarah Brookfield, Cold War Comforts: Canadian Women, Child Safety, and Global Insecurity, 1945-1975
(Waterloo, Ontario: Wilfred Laurier University Press, 2012); Natasha Zaretsky, No Direction Home: The American
M. Loyd, Health Rights Are Civil Rights: Peace and Justice Activism in Los Angeles, 1963-1978 (University of
Minnesota Press, 2014); Elaine Tyler May, Homeward Bound: American Families in the Cold War Era (New York:
¹⁸ Aya H. Kimura, Radiation Brain Moms and Citizen Scientists: The Gender Politics of Food Contamination after
identities. For instance, Michelle Murphy’s work focuses on the political identities constructed through women’s reproductive health care activism in the 1970s.\textsuperscript{19} I see all of the people in this dissertation as engaging in forms of participatory politics, formulating concepts of enacted technoscientific citizenship. Technoscientific citizenship contains two parts. First, people assumed the political power inherent in producing technological and scientific knowledge. Second, they used their ability to act as reliable witnesses to insist on political change to ameliorate the impacts technoscience had on the earth. This analysis also builds on scholars of 1960s and 1970s social movements such as Andrew Blauvelt who suggests that “In their struggle to create a new social, cultural, political, and ecological utopia, the counterculture expressed its political activism and activated its cultural radicalism in new and imaginative ways. [This] … aesthetics of refusal … rejects the given parameters of a practice, obviates the boundaries of a defined field, or alters the course of an instrumental technology.”\textsuperscript{20}

Seeing technoscientific activism as a form of citizenship provides a way to move beyond the current literature on energy citizenship that mainly places this kind of political identity within the realm of energy production. Scholars such as Trish Kahle and Timothy Mitchell have argued that coal miners claimed political power by insisting that their work was essential to national security.\textsuperscript{21} For instance, Kahle relates the ways miners in the 1970s depicted their work as essential as military service, tying energy citizenship to white male identities. One exception to energy citizenship formed through labor may be Caleb Wellum’s analysis of conservation efforts in the 1970s. Wellum contends that two discourses of energy conservation existed in the 1970s:

\textsuperscript{19} Murphy, \textit{Seizing the Means of Reproduction}.
\textsuperscript{21} Trish Kahle, “The Front Lines of Energy Policy: The Coal Mining Workplace and the Politics of Security in the American Century,” \textit{American Quarterly} 72, no. 3 (2020); Mitchell, \textit{Carbon Democracy}.”
one national and one ecological. Wellum discusses citizenship promoted by the nationalist discourse. In contrast, I see the ecological discourse also shaped by citizenship discourses. He also does not deal with the gendered implications of such conservation rhetoric.22

Indeed, gender and race shape citizenship and concepts of nation in myriad ways. As feminist theorist Patricia Hill Collins has argued, national territories are built of specifically raced and gendered concepts of home and family.23 Women’s citizenship has long been associated with their domestic care, with their role in the social reproduction of future citizens seen as their primary political contribution. Focusing my dissertation on technoscientific citizenship and political identities provides a way to see women first not as domestic caretakers but as political beings. They insisted on their ability to construct technoscientific knowledge (which is a form of power) and their right to critique the kinds of technoscience that formed a common world.

In this dissertation, the concept of ecological domesticity stands in direct opposition to most environmental history scholarship focused on women’s domestic care for the natural world. Historians such as Adam Rome show the centrality of women’s organizing in environmental protection but they lean too heavily on the idea that women use their domestic identities to create political change, and fail to question the construction of domesticity in general.24 While Nancy Unger suggests that the maternal politics “overshadowed women’s other contributions to the environment,” in her work women’s domestic citizenship still lingers.25 Rather than seeing

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23 Patricia Hill Collins, “It’s All in the Family: Intersections of Gender, Race, and Nation,” Hypatia 13, no. 3 (Summer 1998).
women’s domestic, maternal, or feminine identities as a foundation for political action beyond the home, I follow feminist theorists Catriona Sandilands and Sherilyn Macgregor who contend that environmentalism based on domestic care forecloses women’s political engagement. As Sandilands writes, maternal environmentalism centers on the idea that “a return to patriarchal and heterosexual ‘family values’ will restore not only a healthy (natural) family but a healthy (natural) planet.” This, Sandilands contends, “reprivatizes political life and, along with it, naturalizes the gendered relations in which the terms are cast.” Indeed, I do not see ecological domesticity as solely the realm of women. Instead, in this dissertation, I understand this concept to be a form of cultural representation that conveys the sense that safety, security, and stability can be achieved when people take personal responsibility to care for the earth. White, heteronormative, middle-class domesticity represented the correct practices of such care. In this, I follow feminist theorist Noël Sturgeon who shows that environmentalism has been represented through images of race, gender, and class. The space of the home helped construct the space of the earth, and as Jade Sasser and other geographers argue, spaces are constructed out of specifically raced and gendered representations. Such representations have specific, material

29 Feminist theorists have begun an extensive conversation about the structural constructions of care. Michelle Murphy, “Unsettling Care: Troubling Transnational Itineraries of Care in Feminist Health Practices,” *Social Studies of Science* 45, no. 5 (2015).
affects, as Traci Voyles argues in her analysis of space, race, and gender in uranium mining landscapes.\(^\text{32}\)

**Technoscientific Activists**

There exists a large literature on women’s international organizing for peace and against militarization. Much of the literature focuses on their construction of maternal activism as political engagement, their international relationships, and the ways this early women’s movement clashed with, and presaged, late 1960s feminist organizing.\(^\text{33}\) For instance, Amy Swerdlow’s work on Women Strike for Peace emphasizes the participants’ deep political engagements and highlights the conflicts that arose between WSP and younger feminists.\(^\text{34}\)

Similarly, Tarah Brookfield’s work shows the gendered construction of Voice of Women’s Cold War activism and Cold War politics of national security. She also suggests that the emergence of feminist activism undid the political power of maternal organizing.\(^\text{35}\) In contrast, my work focuses on the ways such groups mobilized technoscientific citizenship to make specific political


\(^{34}\) Swerdlow, *Women Strike for Peace*.

\(^{35}\) Brookfield, *Cold War Comforts*. 
demands. I also do not see their work leading directly to second-wave feminism but to the AT movement. This allows me to see their activism as not limited by gendered political identities, as these women were as concerned with technological harm as they were with specific forms of femininity. Indeed, relating AT to women’s antinuclear organizing helps us to see AT as the antinuclear statement it was, while also providing different genealogies for women’s antinuclear activism.

Most environmental historians frame AT as a form of technophilic environmentalism. Andrew Kirk, for instance, celebrates the “pioneers” that turned to individual entrepreneurial actions rather than contentious environmental politics. Henry Trim has shown that the rise of technocratic politics provided the grounds for AT to gain funding and a wider audience, while Fred Turner links AT to the rise of “cyberculture.” Peder Anker shows that ecological design groups desired to blend art and science, and while critiquing AT for its lack of political engagement, focuses on a masculine genealogy by linking ecological design to the immigration of Bauhaus designers from Europe. Science Studies scholars, some of the first to discuss AT, untangled the ways AT activists connected technology to politics, questioning whether

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technologies could, in fact, bring political change.\textsuperscript{39} AT has also been seen as part of the radical science movements of the 1960s and 1970s that critiqued the power relationships inherent in technoscience and constructed alternatives.\textsuperscript{40} As historian Samuel Hays writes, AT “fostered the acquisition of knowledge not through professional specialists but through self-education and personal experience.”\textsuperscript{41} While most of this scholarship focuses on the leaders of the organizations, I discuss the many different kinds of people that made up these groups. As Jordan Kleiman noted, the people who made up the bulk of this activism have not yet been included in historical narratives.\textsuperscript{42} Scholarship, despite its range, has not explicitly dealt with the ways gender constructed AT activism. Only Carroll Pursell, who argued that people constructed AT as a radical social alternative through feminine representations, has grappled with gender in any significant way.\textsuperscript{43} What Pursell did not take into account was not only the feminization of technology but the gendered identities formed through representations of male AT pioneers and bricoleurs wielding scientific acumen, while women in AT undertook domestic care.

Scholars have also not dealt with the implications of AT’s focus on the space of the home, even though they do highlight the centrality of homes to this activism. Only the architectural historian Felicity Scott deals with the spatial practices of home and earth.\textsuperscript{44} In fact,

\begin{itemize}
\item \textsuperscript{42} Jordan Kleiman, “The Appropriate Technology Movement in American Political Culture” (Dissertation, University of Rochester, 2000).
\item \textsuperscript{44} Scott, \textit{Outlaw Territories}.
\end{itemize}
seeing that AT took shape primarily in homes makes a gender analysis even more pertinent to the movement. As Andrew Kirk argues, AT “fit perfectly with American traditions of property rights and cultural assumptions about individual control over the home … The ability to move Ats into the world of the American home was of critical importance in the 1960s and remains so in the first decade of the twenty-first century.” Similarly, Pursell shows that AT reacted specifically to the environmental destruction caused by the post-war housing boom. According to the historian Samuel Hays, AT focused on “household activities around solar energy, composting to utilize waste, and organic gardening.” It thus provides a movement through which to look at the ways ideas of home and ideas of planetary ecology intersected, and the gendered construction of them both.

Finally, AT is often discussed in relation to international development programs. Many cite E.F. Schumacher’s work on intermediate technology as a point of origin for this movement. While literature on AT in the Global South does include some gender analysis, particularly in relation to “women in development” or “women and environment,” no one has asked how the social relationships exported along with these technologies came into existence. By looking at gender in Global North AT movements, we get some sense of what kinds of social orders were institutionalized when AT was used in development projects.

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45 Kirk, Counterculture Green, 87-88.
47 Hays, Beauty, Health, and Permanence, 261.
49 This is a vast literature. For one example, see Melissa Leach and Cathy Green, “Gender and Environmental History: From Representation of Women and Nature to Gender Analysis of Ecology and Politics,” Environment and History 3, no. 3 (1997).
50 Feminist scholars have shown that both colonization and later development projects took shape specifically through the space of the home. For instance, see Mona Domosh, “Practising Development at Home: Race, Gender,
Foregroun... and feminist technoscience movements of the 1970s and 1980s. The literature on both ecofeminism and feminist technoscience activism is vast.\textsuperscript{51} That related to feminist critique of technoscience usually focuses on women-centered groups, which obscures feminist critiques emerging from movements such as AT. While historians including Carolyn Merchant have cited the AT movement as one strand leading women to environmentalism, this connection has not been examined in the literature.\textsuperscript{52} I show the connections between AT groups and early ecofeminist conferences such as “Women and Life on Earth,” held in Amherst, Massachusetts in 1980. By linking 1970s feminist activism to women’s disarmament activism in the early 1960s through AT, I suggest that these women were compelled not only by gendered concerns but with political technoscientific aims in mind.

Women’s antinuclear activism, the AT movement, and feminist technoscientific critique all took shape as transnational social movements. This dissertation primarily includes discussions of activists in Canada and the United States, but it also looks to AT groups in the United Kingdom. It follows the transnational networks of activist communities because their work was not shaped by national boundaries, and individuals moved across national lines throughout their lives.


lives. Indeed, some of the work of these groups focused on overturning conventional nation-state political ideologies for a politics of global ecological connection. While groups responded to politics at a national scale, they formed friendships, alliances, and drew inspiration from people across national boundaries. This has been well-documented in women’s disarmament campaigns. It has not been a part, though, of most histories of the AT movement. However, their transnational networks were essential to their success and to their goals. As this dissertation shows, particularly in my discussion of the New Alchemy Institute, a full recounting of their organization would not be possible without including narratives from the United States and Canada. The sources required a transnational lens, which provides a more complete history of activists who did not see their work as bound by national borders.53

All of the movements I discuss were focused on critiquing technoscientific power and on creating alternative common worlds. Many of their concerns were the same: that humans had somehow reached a point where they were destroying life on earth, that they needed to find ways to care for the finite planet, that they needed to find ways of conveying their concerns into the public realm. They insisted that technoscientific decisions were political, as Hannah Arendt argues, “a political question of the first order,”54 and that they could not leave those decisions to scientists or politicians. These technoscientific activists helped create the imagery of a finite earth. They also argued that a plethora of political identities could inhabit it. For as Arendt argues, the context of the earth provides the basis for human plurality, and “men, not Man, live on the earth and inhabit the world.”55 This plurality depends on radical individual difference

53 Many scholars of women’s disarmament movements note their transnational activism. For instance, see Frazier, “Collaborative Efforts to End the War in Viet Nam.” For a discussion of the possibilities and shortcomings of transnational history, see Bayly et al. “AHR Conversation: On Transnational History.” The American Historical Review 111, no. 5 (2006).
54 Arendt, The Human Condition, 3.
despite which we “can experience meaningfulness only because [we] can talk with and make sense to each other and to [our]selves.”\textsuperscript{56} The people who inhabit this dissertation insisted on care for the earth through the plurality of earthly politics.

\textbf{Chapter Outline}

Chapter one details Cold War domesticity and the ways people in the women’s disarmament groups Voice of Women and Women Strike for Peace used geopolitical concerns over home and family to claim new political identities. They did so through their domestic identities and by creating technoscientific knowledge of the differential impacts of global radioactive fallout. This chapter follows the Voice of Women’s radiation brief written by the physicist Ursula Franklin and organizational disagreements that resulted from this report. Some members of VOW critiqued Franklin and others for claiming the right to produce technoscientific knowledge and make political claims based on that knowledge, suggesting that it undermined their maternal femininity. Franklin insisted that women had the right to participate in technological choices that affected their bodies and homes. For these women, technoscientific knowledge production was a political act that did not fully overturn conventional domestic identities.

Chapter two turns to the Appropriate Technology movement that emerged in the late 1960s. In response to growing concerns over humans’ impact on a finite earth, these activists promoted “small scale” technologies to provide food, shelter, and energy. I suggest that AT constructed a form of technoscientific citizenship that foregrounded personal autonomy and responsibility. For AT advocates, control over technology could lead to economic and political power, whether at the scale of individual “self-sufficiency” or in “developing” nations. This held

\textsuperscript{56} Arendt, \textit{The Human Condition}, 4.
the promise of an expansive technoscientific citizenship in which all people were given the power to form knowledge of a shared material world. I also develop the idea of “ecological domesticity” in this chapter, as AT argued that correct domestic practices could care for a limited, at-risk earth. I conclude by examining the ways people used gendered imagery to promote their technological activism. I argue that rather than transformational, these representations often aligned with traditional white, middle-class, heteronormative domesticity and masculine technoscientific invention.

I expand my discussion of AT in chapter three by looking at women’s participation in the movement. I suggest that women’s political identities were formed not through domesticity but in the larger social and culture shifts of the 1960s and 1970s. Unlike many narratives of emergent feminist consciousness in which women faced antagonism from male-dominated groups, in AT these women found places that supported consensus-based decision making, pay equity, and an expansive view of who could produce technoscientific knowledge. I argue that AT provided them access to new forms of technoscientific citizenship. At the same time, women’s experiences differed from men’s, particularly in domestic work and maternal care. While women held various views on such feminine responsibilities, many began to critique the gender inequities present in AT organizations.

Chapter four traces one AT organization, the New Alchemy Institute (NAI), from its founding in 1969 through the end of the 1970s. This chapter thus provides a specific example of how one group enacted its ideas of technoscientific citizenship and ecological domesticity. For NAI, producing science in the home could provide all people with the ability to create knowledge that mattered to them, and therefore overturn the power institutional science held over public life. The chapter follows New Alchemy as it gained support from the Rockefeller
Brothers Fund and the Canadian government, showing the ways AT moved from grassroots activism into government agencies and international foundations. I suggest that the white, heteronormative ecological domesticity that AT used to describe its ecological technologies made their work less threatening to social power hierarchies. At the same time, the use of domestic imagery made people question the scientific validity of NAI’s technologies, undermining their desire to merge earth and home.

Chapter six deals with the ways the Canadian crown corporation, the Science Council of Canada, promoted resource conservation in homes. The SCC “conserver society” aimed to turn Canadians from “consumers” to “conservers.” Ursula Franklin, the physicist who had written the Voice of Women’s radiation brief in 1962, chaired the conserver society committee. I argue that Franklin assumed a form of technoscientific citizenship in her work on the committee. She argued for government responsibility to regulate corporate use of natural resources and against foreign ownership of Canadian energy sources. She did so with the same politics as those embraced by the VOW, shaped by a concern for human and ecological protection against militarization and corporate profit. However, in public discussions, the conserver society took on the same forms of ecological domesticity as AT had, with Canadians, especially women, again enjoined to care for the earth through personal care for the home. The chapter concludes with women speaking out against the unequal structural relationships women had to resource use and the gendered implications of the conserver society.

The final chapter follows women’s discussions throughout the 1970s as they asked what the relationship was between feminism, ecology, and technology. I detail the forms of feminist analysis women brought to bear on the AT movement and on technoscience in general, contending that they constructed various feminist technoscientific political identities through the
pages of AT publications and at conferences dedicated to women and technoscience. The chapter then turns to the Women and Life on Earth conference held in Amherst, Massachusetts in 1980 as a turning point in these conversations. While many histories place this conference in a genealogy of ecofeminism, I suggest that it is also a point of origin for feminist science and technology studies, as many women involved were part of AT and concerned with women’s relationship to technoscience. At the conference, the desire to create a unified political stance of women protecting life on earth disintegrated in the face of Black women expressing their distance from white women’s concerns. While a cohesive identity did not emerge, the conference indicated participants’ openness to listening to other people speaking for life, earth, and the impacts technoscience. The varied politics of technoscience ultimately remained of central concern to these women.
CHAPTER 2

“AS DEVOID OF EMOTIONALISM AS POSSIBLE”: COLD WAR DOMESTICITY AND WOMEN’S TECHNOSCIENTIFIC CITIZENSHIP

In the early 1960s, two women’s organizations formed to protest Cold War nuclear politics and technologies. The Voice of Women (VOW, La Voix des Femmes, Canada) and Women Strike for Peace (WSP, United States) used maternal rhetoric to argue for a cessation of nuclear testing and an increase in international cooperation to allay Cold War tensions. Most historians frame this activism as a chapter in international women’s movements, in the politics of maternal care, or as the turning point in the gender status quo of Cold War domesticity.\(^{57}\)

In this chapter, I suggest that WSP and VOW were also engaged in shifting women’s relationship to technoscientific citizenship.\(^{58}\) As they began to research fallout patterns, they assumed roles as the creators of scientific knowledge and positioned themselves as reliable witnesses for rejecting military technologies.\(^{59}\) They hold a crucial place as an early grassroots movement that questioned the ideology of modern technoscience’s continual progress. Through their critiques of Cold War violence, they re-made the possibilities for women’s citizenship, crafting new political identities that merged maternal care with scientific objectivity.\(^{60}\) They

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\(^{59}\) I draw on Michelle Murphy’s extensive work on witnessing, feminist activism, and scientific knowledge production here. Murphy, *Seizing the Means of Reproduction: Economization of Life; Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers* (Durham: Duke University Press, 2006); “Unsettling Care.”

\(^{60}\) As Lorraine Daston and Peter Galison argue, scientific objectivity is directly tied to practices of subjectivity and the production of the self. Daston and Galison, *Objectivity.*
were able to claim novel political identities by building on the geopolitical framework that placed domestic arrangements at the center of national political success. However, their activism also revealed the ways such citizenship remained the purview of white, middle-class women when they were confronted by Black women who did not have the same political relationship to maternal care.  

In the summer of 1960, several professional women founded VOW in response to articles written by Lotta Dempsey calling for women, as women, to stand against Cold War violence. As historian Tarah Brookfield describes, letters poured in from women asking what they could do. In the first few years, VOW activism focused on disarmament campaigns and emphasized the women’s apolitical stance, leveraging maternal rhetoric to argue for the safety of all children in the face of potential nuclear annihilation. WSP began in November of 1961 with a women’s strike for disarmament. Both organizations were composed largely of middle-class, white, professional women and organized through decentralized chapters across North America.

VOW and WSP activism revealed the relationships between human bodies, homes, and the environments detrimentally altered by Cold War politics. Rather than “emotional” beings, WSP and VOW members attempted to claim rationality – alongside maternal responsibility – in their arguments for governmental radiation monitoring and against the Vietnam War. The political identities they shaped were part of a shift in cultural understandings of femininity and women’s role in public life. Their work also helped construct ideas of a shared global space.

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61 Jenna Loyd’s work is crucial to understanding the racial underpinnings of WSP activism. Loyd writes that “interpretations of women’s bodies as threats to be contained were also racialized. White peace mothers destabilized terms of state protection undergirding militarized domesticities, while only sometimes challenging the white supremacist terms through which they could invoke ‘the home’ as a political platform. Black and Latina women found that their bodies and homes were different battlegrounds.” Loyd, *Health Rights Are Civil Rights*, 9.

62 Brookfield, *Cold War Comforts.*
defined by heterogeneous fallout effects. These women argued for specific citizenship rights and responsibilities in the face of border crossings between national and natural territories, a crossing that took shape in the space of the home and in the resonance of the nuclear bomb.

**Cold War Domesticity and Women’s Citizenship**

According to the historian Greg Castillo, by the time Soviet Premier Nikita Khrushchev and American Vice President Richard Nixon stood debating the relative merits of American middle-class domestic appliances at the American National Exhibition in July 1959, the two Cold War powers had been deploying idealized domesticity for well over a decade in their soft-power war. Indeed, Cold War politics and ideologies of domesticity were intwined into what Elaine Tyler May refers to as “domestic containment,” the sense that the self-contained home “held out the promise of security in an insecure world. It also offered a vision of abundance and fulfillment.” Not any home, however, but white middle-class homes fulfilled the promise of economic and social security in the face of nuclear annihilation, economic uncertainties, and geopolitical unrest. For Nixon, and for many others, the home provided the space to quell economic tensions by promising equality of consumption and to suppress the possibility of women unbound by domestic duties.

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63 Natasha Zaretsky argues that the 1960s and 1970s marked a cultural shift in concepts of family. Zaretsky, *No Direction Home*. Adam Rome claims that such women were essential to the emergence of environmentalism but fails to express the changing identity of “housewives.” Rome, *The Genius of Earth Day*; “Give Earth a Chance.”


65 May, *Homeward Bound*.

66 As May writes, the white middle-class home was central to this political ideology, and “those who did not conform to them were likely to be marginalized, stigmatized, and disadvantaged as a result.” May, *Homeward Bound*, 13. Jenna Loyd furthers May’s suggestion, focusing on the ways not any home, but particularly raced and classed homes, were the correct spaces for state protection. Loyd, *Health Rights Are Civil Rights*, 108.

67 According to May, “The family home would be the place where a man could display his success through the accumulation of consumer goods. Women, in turn, would reap rewards for domesticity by surrounding themselves with commodities.” May, *Homeward Bound*, 164.
While national leaders embraced the symbolism of the home as a site of Cold War power in their debates, the material reality of what scholar Joseph Masco calls the “Age of Fallout” undermined state claims of the protection of homes, women, and children. For Masco, “fallout positions the citizen less as a national subject than as an earth dweller, one increasingly at risk” and this “directly challenges the territorial vision of the national security state system, as international borders and security states are rendered irrelevant by windborne industrial effects within changeable earth systems.”\(^6^8\) From the first nuclear test by the United States government in 1945 through the early 1960s, nuclear blasts sent radioactive isotopes into the atmosphere. Primarily set off by the Cold War powers, these tests took place on Pacific islands, in the United States’ southwestern deserts, in France’s Algerian colony, and other spaces deemed pollutable and acceptable to harm.\(^6^9\) While national leaders presented the home as the bulwark against technological violence, including the atomic bomb, the reality of potential nuclear war presented the opposite specter: a state that could, in no way, promise safety on the “home front.”\(^7^0\) As Traci Voyles argues, “images of vaporization of white American domesticity distilled atomic anxieties into their purest form: the Cold War represented a threat to this most heteronormative nucleus of white capitalist life.”\(^7^1\)

The first studies of radioactive flows through ecosystems took place on islands test-bombed by the United States. Ecologists re-imagined these islands as the “world in miniature”\(^7^2\)

\(^6^9\) Over 2,000 tests took place between 1945 and 1996. Over 500 of these were atmospheric, many before the 1963 Partial Test Ban Treaty. For the concept of spaces as pollutable, see Voyles, *Wastelanding*.
\(^7^0\) Masco calls fallout a moment of the “coproduction, a simultaneous remaking of nature and society via collective injury,” an injury that provided the “structuring principle of American modernity.” Homes themselves, the air one breathed, became laden with violence. Masco, “The Age of Fallout,” 140.
and as isolated spaces separate from others, providing themselves with boundaries for their experimental work. When Eugene and Howard (Tom) Odum began studying radioactive flows through trophic systems in 1955 on the island of Enewetak, they arrived with the desire to demonstrate universal properties of ecosystems through the specifics of a Pacific island. However, the bombs that provided the radioactive materials that made the Odums’ ecological studies possible were far from limited to “nuclear colonization” of the people inhabiting these islands. Fallout soon came to be seen as a threat to people across the world, calling into doubt the sense of control, isolation, or safety for any body in the nuclear age.

However, the global, but uneven, impacts of nuclear radiation were not immediately obvious. The production of knowledge about radiation threats has largely been considered under the rubric of professional scientists, such as Barry Commoner, drawing attention to the inability of modern science to live up to its promise of uncompromised progress. Citizen activists who fought against nuclear weapons and nuclear power have been seen as reacting to, rather than producing, knowledge of radioactive threats. While Rachel Carson’s 1962 Silent

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74 Martin, “Proving Grounds.”
75 Masco, “The Age of Fallout,” 146.
76 This is not to discount the severe violence of those who were bombed, including those living on Pacific Islands, in Africa, and in the U.S. desert. Indeed, one argument here is that the threat of fallout emerged not out of the bodies that were most harmed but out of white domesticity. Richard N. L. Andrews, Managing the Environment, Managing Ourselves: A History of American Environmental Policy, Second ed. (New Haven: Yale University Press, 2006), 212. As Lisa Rumiel has written about Rosalie Bertell, an antinuclear activist and epidemiologist, there were scientists whose science showed the effects of radiation but they were discounted. Lisa Rumiel, “Getting to the Heart of Science: Rosalie Bertell’s Eco-Feminist Approach to Science and Antinuclear Activism,” Journal of Women’s History 26, no. 2 (2014). See Kevin Hamilton and Ned O’Gorman’s work on the affective production of nuclear knowledge by the military studio, “Lookout Mountain Laboratory.” Kevin Hamilton and Ned O’Gorman, Lookout America!: The Secret Hollywood Studio at the Heart of the Cold War (Hanover, New Hampshire: Dartmouth College Press, 2019).
77 Indeed, there remains scientific debate over the effects of radiation levels on humans. Rumiel, “Getting to the Heart of Science”; Kimura, Radiation Brain Moms.
79 Andrews, Managing the Environment, Managing Ourselves.
Spring is largely credited for drawing attention to the omnipresent threats of “biocides,” ushering in what Maril Hazlett has called the “ecological turn” in American health, women in the years leading up to 1962 were actively producing knowledge about radiation and other chemical threats.80

In what follows, I show that women in groups usually considered part of the historiography of maternal peace movements produced knowledge of the ways fallout spread across the globe, linking the world in circulations of violence and harm. In the process, they were arguing not only against specific geopolitical configurations but were part of re-configuring just what femininity should contain in shifting world orders.81 The inversion of spaces – the boundary crossing of homes and war, public and private – opened avenues for women to take on new political roles while also maintaining traditional maternal identities. Indeed, the repressive McCarthyism of the 1950s made domesticity an ideal protection against accusations of radicalism and communism.82

80 In environmental history literature, scholars primarily analyze women’s production of scientific and environmental knowledge through reaction to Carson’s work. One of the inspirations for this chapter lies in the dearth of attention to contemporaries of Carson who formed the affective understanding of chemical threats to human life. Recently David Hecht has suggested that Carson was more conservative than environmental historiography has depicted her. Maril Hazlett, “Voices from the Spring: Silent Spring and the Ecological Turn in American Health,” in Seeing Nature through Gender, ed. Virginia Scharff (Lawrence, Kansas: University Press of Kansas, 2003); Maril Hazlett, “‘Woman Vs. Man Vs. Bugs’: Gender and Popular Ecology in Early Reactions to Silent Spring,” Environmental History 9, no. 4 (2004); David K Hecht, “Rachel Carson and the Rhetoric of Revolution,” Environmental History 24, no. 3 (2019); Michael B. Smith, “‘Silence, Miss Carson!’: Science, Gender, and the Reception of Silent Spring,” Feminist Studies 27, no. 3 (2001). Both Richard Andrews and Graeme Wynn point to Carson as integral to public awareness of chemical pollution. Graeme Wynn, “Framing an Ecology of Hope,” Environmental History 25, no. 1 (January 2020); Andrews, Managing the Environment, Managing Ourselves, 217.

81 May suggests that the emergence of Women Strike for Peace marked the end of the Cold War consensus of domesticity. Here I follow Estepa who suggests that these women were integral to the emergence of “the Movement” in the 1960s through their own maternalism and their insistence on changing political stances. May, Homeward Bound, 218; Estepa, “Taking the White Gloves Off.”

82 Estepa, “Taking the White Gloves Off.”
The Voice of Women’s Radiation Brief

When Diana Wright wrote to Ursula Martius Franklin in August of 1963, amid discussing the potential follow-ups to the Voice of Women’s “Radiation Brief,” she noted that at a non-violent action training she had “learned so much that may be helpful in doing what you want: to build the peace movement horizontally – direct communication so we can get at the truth.”

Franklin, a post-WWII immigrant from Germany, physicist, Quaker, and the director of research for the VOW, had just finished a research project that compared the governmental monitoring of radiation in Canada to other nations’ monitoring systems. Since the summer of 1962, Franklin had dedicated herself to preparing regional surveys of fallout across Canada, during which time her “family and … work ha[d] suffered without any correspondingly worthwhile return for VOW.”

Franklin’s work in organizing the collective compilation of fallout data for Canadian provinces aligned with organizational changes that occurred from 1962 through 1963. Marie Hammond-Callaghan argues that early VOW leadership “carefully guarded an image of middle-class feminine respectability and political moderation” to avoid charges of communism in the tense Cold War political climate. By 1963, Hammond-Callaghan argues, VOW had turned towards “progressive, feminist, and New Left politics” including political statements and direct actions against Canadian nuclearization. The shift to New Left politics is usually explained by noting the leadership of New Democratic Party (NDP) president in Quebec Thérèse Casgrain, followed immediately by Kay Macpherson’s presidency. Macpherson was also a member of the

83 Diana Wright to Ursula Franklin, August 1963, Box 42, Folder 5, B1996-0004, Ursula Martius Franklin Fonds (UTA 1287), University of Toronto Archives (hereafter UMFF-UTA).
84 Franklin to Helen Cunningham, May 31, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
85 Hammond-Callaghan, “Bridging and Breaching Cold War Divides,” 137.
86 Hammond-Callaghan, “Bridging and Breaching Cold War Divides,” 139.
NDP, a feminist activist, and the wife of radical political theorist C.B. Macpherson. A close reading of correspondence surrounding Franklin’s research, and the ways it intertwined with internal organizational debates over the correct form of women’s activism, indicate that the radicalization of the organization had alternative origins. Franklin and others claimed the ability to produce knowledge of the effects of nuclear tests and claimed the power to demand government action based on their scientific acumen. In this, they assumed technoscientific citizenship. They compiled data about radioactive fallout at a time when debates still swirled in the scientific community about the expanse and dangers of radiation, and they did so with specific political aims in mind.

The VOW’s radiation study also aligned with debates over Canadian citizenship and sovereignty. Throughout John Diefenbaker’s time as prime minister, he seemed indecisive as to whether and how to accept nuclear weapons from the United States. Historian Nicole Marion suggests that this was due to questions of Canadian sovereignty – what power would Canada have over weapons given to them by the US? What would the response of the public be to such a decision? At the same time, the national government in Ottawa was facing increased pressure

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90 According to Marion, Diefenbaker’s “strategy did not change when antinuclear organizations made their greatest demonstration of strength in the fall of 1961. Instead, his hampering of negotiations was tied to concerns for Canadian sovereignty.” Marion, “‘I Would Rather Be Right,’” 156.
from the Quebec “Quiet Revolution,” demanding cultural independence if not outright sovereignty from English Canada.

It was in the midst of these national debates that the VOW had its own internal discussion over the meaning of women’s citizenship and the correct form of women’s activism. Ursula Franklin and her scientific training became a point of contention for those who wished VOW would remain on a moderate path. These VOW members continued to embrace “feminine respectability and political moderation” and believed this political identity would be endangered if the group made concrete demands for governmental action based on their reporting of radiation hazards. For those who embraced organizational change, creating scientific knowledge – “direct communication so we can get at the truth” – became central to their activism and to their re-structuring of women’s responsibilities as citizens.

Ursula Franklin agreed to become the VOW research chair in the summer of 1962 specifically to study the effects of fallout in Canada. As she wrote to Beatrice Hayes, President of the National Council of Women, “You will surely understand that it is not an empty phrase when I say that many things I do are motivated by the deep wish that my children should never experience many of the things that I have experienced in my life.” Hayes, a Jewish woman from Montreal, had welcomed Franklin when she arrived in Canada on a Lady Davis Fellowship. It is likely Franklin felt especially welcomed by Hayes as Franklin herself had spent time interned in Germany during the war, “in forced labor groups, etc. because of half-

91 Hammond-Callaghan, “Bridging and Breaching Cold War Divides,” 137.
92 Aya Kimura suggests that we must ask “What kind of citizen is implied in citizen science in a specific historical context?” In this case, Franklin and others were pushing for a citizenship that insisted on government accountability. Kimura, Radiation Brain Moms, 17.
93 Franklin to [Mrs. Saul] Beatrice Hayes, June 17, 1963, Box 42, Folder 6, Accession B1996-0004, UMFF-UTA.
94 Franklin to Hayes, June 17, 1963. Hayes was also concerned with environmental pollution, citing Carson’s newly published Silent Spring at the International Council of Women’s meeting in Washington, D.C., June 1963, where Carson was also in attendance. Naomi E.S. Griffiths, The Splendid Vision: Centennial History of the National Council of Women (Ottawa: Carleton University Press, 1993), 276-77.

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Franklin, who finished her PhD in physics after the war, also “protested strongly against the revival or nationalistic trends and nationalistic teaching at certain West German Universities” before immigrating to Canada in 1949. By 1952 she had married Fred Franklin and brought both of her parents over from Germany. As Franklin wrote of herself, “The utilization of scientific thoughts and methods in the struggle for peace and international understanding is a major concern to her.”

By October of 1962, Franklin was assuring Casgrain that fallout monitoring was one of the most crucial issues for VOW membership: “there is no subject more on the minds of our members, and they will rightly expect sooner or later – preferably sooner – some statement and possible action on the part of the executive.” Franklin was “very anxious to get all the facts straight and watertight, because we should not look like a bunch of hysteric females, getting worked up over newspaper reports. I can handle the radiation data all right but I am very short of unbiased medical advice.” Women such as Franklin in VOW insisted that radiation monitoring and, indeed, the end to all nuclear testing was the responsibility of the Canadian government, their right as citizens, and a right of all people across the world.

A November 1, 1962 statement of demands to Prime Minister Diefenbaker revealed these women’s insistence on linking a critique of nuclear technologies to the politics of self-determination and governmental responsibility for public health. A group of women delivered VOW’s demands after traveling to Ottawa on a “Peace Train” at the beginning of November

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96 Franklin to Hayes, June 17, 1963, Box 42, Folder 6, Accession B1996-0004, UMFF-UTA.
97 Ursula Franklin, typewritten biographical sketch, n.d., Box 38, Folder 2, Accession B1996-0004, UMFF-UTA.
98 Franklin to Casgrain, October 21, 1962, Box 38, Folder 1, Accession B1996-0004, UMFF-UTA.
99 As Traci Voyles argues, domesticity tamed nuclear fears but that same domesticity allowed women to organize politically against nuclear technologies and Cold War politics. Voyles, “Anatomic Bombs.”
1962. As Thérèse Casgrain wrote on behalf of the group, they rejected the idea that Canada should acquire nuclear warheads while accepting the Canadian belief in the “right of self-determination of any country, large or small; the consent of the governed in domestic and foreign politics; the right of ourselves and our families to self-preservation.” Casgrain continued: “Millions of people must feel, as we do, an urgent desire to regain a measure of control over their own destinies … There is no higher loyalty than the devotion to the welfare of the human family, and there is no conflict between this loyalty and any true national interest.”

While historian Patricia McMahon claims their brief “contained little new” it quickly set off an internal fire storm that threatened to break apart VOW.

For just two weeks after the brief was submitted to Parliament, Jo [Josephine] Davis, a founder of VOW, took the mailing list for the group and wrote a six-page rallying cry for the moderation of the group. VOW’s mission, Davis wrote, was to “not make a raison D’etre and cause Celebre [sic] of certain national political issues that are divisive not unifying. (Remember our goal was to unite women in a common cause and program!) … Don’t we as women know that gentle persuasion is more effective than nagging?”

Davis expressed grief that the brief submitted to the government took specific views on “banning-the-bomb” and refusing Canada’s nuclearization, as these were contentious political topics that could divide women and would encourage moderate women not to join VOW.

Davis included a survey in her statement asking members to respond to questions about the “main emphasis” of the group. She contrasted the “promot[ion of] a climate of international understanding” with “promoting … more specific political objectives such as ‘no nuclear arms

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100 Brief to the Prime Minister, November 1, 1962, Box 38, Folder 1, Accession B1996-0004, UMFF-UTA.
101 McMahon, Essence of Indecision, 154.
102 Jo Davis to VOW members, November 16, 1962, Box 38, Folder 5, Accession B1996-0004, UMFF-UTA. See also Hammond-Callaghan, “Bridging and Breaching Cold War Divides.”
for Canada” and demanded to know people’s views on “militant” actions such as “public demonstrations.”

Over 1,000 letters poured in responding to Davis’s appeal, many, according to Davis, in agreement with her moderate position. However, while she had asked for a “yes or no” answer, Davis received reams of replies; many were generally in agreement but expressed views that could not easily be categorized in Davis’s fashion of “moderate” or “militant.”

The correct role of women in public life – their enacted citizenship – lay at the heart of this matter. As one wrote, “I too do not think that protest marches are the answer to this, but rather good public relations work. Thank you for your letter. May we continue to progress in our womanly ways.” Or another, “Some of our members have dropped out of the organization because of the trend it appears to be taking.”

Still others expressed the ways concepts of femininity constrained women’s political actions and that the VOW should resist such narratives:

It is unfortunate, but true, that the questions of war and peace are political and there will be many times when the only recourse of women will be to put pressure – politically – on the powers that be, and the powers that would-like-to-be! … If the determination of women did not blossom out into something more militant and aggressive after two or three years it would be half dead or, at best, just another Country-Women-of-the-World sort of group with the best complacent intentions in the world, and deserving and getting only pats on the head from the men in power, who really would like VOW to be a nice group of well-mannered ladies who do not intend to upset the status quo.

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103 Jo Davis to VOW members, November 16, 1962, Box 38, Folder 5, Accession B1996-0004, UMFF-UTA.
104 According to Davis, 1130 letters had been returned, which likely underestimated the number of people who responded as some were responding as a group. Of these, 885 preferred a more moderate position, 86 preferred both demonstrations and moderation, 112 were dissenting. Davis to Franklin, December 22, 1962, Box 59, Folder 21, Accession B2015-0005, UMFF-UTA.
105 Typescript of survey responses, Mrs. Nicol, Victoria, B.C., Box 59, Folder 18, Accession B2015-0005, UMFF-UTA.
106 Typescript of survey responses, Mrs. Fargey, Edmonton, Alberta, Box 59, Folder 18, Accession B2015-0005, UMFF-UTA.
107 Typescript of survey responses, Mrs. Richards, Prince Albert, Box 59, Folder 18, Accession B2015-0005, UMFF-UTA. In Kay Macpherson’s memoir, she notes that the difference between VOW and “older established groups” was that VOW “responded to events by action,” precisely what Davis wished VOW not to do. Macpherson, *When in Doubt, Do Both*, 98.
The question of women’s political voice, and whether there could, in fact, be a singular “voice of women” came out in personal letters to Ursula Franklin as well.\textsuperscript{108} For Isabel LeBourdais, “Presumably we are a women’s organization working for peace. This in itself is so vague that every woman in Canada can join so long as we never do anything but issue pious platitudes.” LeBourdais went on to note that

If we intend to become a strong movement of women for peace we have to be courageous, we have to antagonize thousands of people, many of them women, we have to be a thorn in the side of politicians whether government or opposition who follow the conventional views represented in NATO and NORAD; we have to annoy the press, and earn all sorts of nasty names. Why? Because in this year of 1963 peace is \underline{NOT} the first objective of the men who run the countries of the world. Competition for prestige is.\textsuperscript{109}

Davis began to show her dislike of both the French-Canadian political struggles and her antipathy to Franklin’s “scientific” credentials in her analysis of these responses. She wrote, while attempting to coordinate with Franklin on the best way to report on the survey, that people such as Thérèse Casgrain could solve differences between themselves and “moderates” by “reaching down,” and by working beyond the “isolation” of French-Canada, ending one of many post-scripts by handwriting “This P.S. sounds rather ‘anti-French-Canadian’ – I’m sorry. It’s not meant to be. But it does have a bearing on what’s happened. I do understand their problems I do sympathize. I have no ill-will towards anybody. But I can’t help feeling ‘frustrated’!!”\textsuperscript{110}

January 1963 arrived as a storm breaking, both for internal divisions in VOW and Canadian political decisions regarding the acquisition of nuclear weapons. On January 3, a retiring NATO commander for Europe intimated that Canada was required to accept nuclear

\textsuperscript{108} Much has been written about the impossibility of organizing as women, an undifferentiated collective. For critical work in this, see Joan Wallach Scott, \textit{Gender and the Politics of History} (New York: Columbia University Press, 1999).

\textsuperscript{109} Isabel LeBourdais to Franklin, January 7, 1963, Box 38, Folder 5, B1996-0004, UMFF-UTA.

\textsuperscript{110} Davis to Franklin, December 22, 1962, Box 59, Folder 21, B2015-0005, UMFF-UTA.
warheads as part of its treaty obligations. Just nine days later, Lester Pearson, head of the Liberal party and long-time opponent of nuclearization, announced that if his party won the upcoming elections, Canada would become a nuclear power.111

On January 19, 1963 over 150 women gathered at a VOW “Day of Study” in Halifax, just one week after Pearson’s announcement. Here, Jo Davis made another case for the maternalism and moderation of the VOW. According to Royal Canadian Mounted Police files on Ursula Franklin, collected as part of their work on “Communist activities in Canada,” Davis spoke “about the role women could play capitalizing on their special role as mothers and she said, ‘when Mr. Green phoned me once, I was actually nursing my little son at my breast as I talked to Mr. Green.’” Franklin then stood to give the response to the surveys, embracing women’s differences: “Members do care. Difference of approach towards the same goal. Divergence of opinion really a strength. Not at cross-roads …. Only getting a broader perspective. Every action for peace was legitimate.” Others stood to support Franklin and Casgrain, and although the women allowed Davis six more minutes to speak, at the end of which she insisted that VOW had “failed,” the majority sided with Franklin.112

Davis felt that Franklin had not represented the survey results fairly, writing a long diatribe against Franklin, Diana Wright, and Kay Macpherson.113 According to Davis, Franklin had “used her ‘scientific’ status to convince others.” After pages outlining the ways the facts had been manipulated and meetings run by minority rule through “undemocratic processes,” Davis

111 Marion, “I Would Rather Be Right,” 154.
113 Wright was head of the Saskatchewan VOW, Macpherson would become the next president after Casgrain resigned as she would be running in the 1963 elections. This incident still reverberated nearly a year afterwards, as conversations recorded by the RCMP on February 24, 1964 indicate. Women were still referring to Davis’s “yellow document” (which I assume is the undated manuscript accusing Franklin, Wright, and Macpherson of communism) and worries over whether the entire affair had been a Liberal party maneuver. Ursula Franklin RCMP files, 1949-1965, p. 42-45, UMFF-UTA.
concluded that “The movement began to think and look like a Communist outfit … and the more it proceeds in that direction, the more the moderates fall away, the more the extreme grows and attracts its own kind, until the movement becomes overtly Communist, in fact as well as in spirit … her deeds have been enough to suggest to me that Dr. Franklin is a dangerous influence in VOW, no matter what else she is.”

What else was Franklin to VOW? From October 1962 until June of 1963, Franklin compiled data on government monitoring systems, radiation science, and possible health effects of fallout. She discussed fallout monitoring with women in the United States and had women across Canada monitor their provincial Department of Health and Welfare annual reports for monitoring activities. After receiving a letter from a VOW member in Montreal, Franklin also began facilitating a nation-wide baby tooth survey to test for radioactive elements in children’s deciduous teeth (Figure 1). She continued on this work, even as major VOW figures, including Lester Pearson’s wife, Maryon Pearson, left VOW, declaring it “much more belligerent.”

114 Davis letter, n.d. (presumably January 1963), Box 59, Folder 21, B2015-0005, UMFF-UTA.
115 See correspondence in Box 42, Folder 5, B1996-0004, UMFF-UTA.
116 See correspondence between Franklin and Ethel Kesler, Box 42, Folder 5, B1996-0004. The VOW baby tooth resembled the work done by Barry Commoner at the University of Washington, St. Louis, MO. Indeed, Kesler mentions this in her original letter to Franklin (Feb. 11, 1963). Joanna Dean discusses Kesler. Dean, “A Gendered Sense of Nature.” Andrews discusses the citizen-scientist activism done by Commoner’s organization, Scientists’ Institute for Public Information. Andrews, Managing the Environment, Managing Ourselves, 212.
Figure 1. Brochure promoting the VOW baby tooth survey. The brochure explained the threat of radiation from atomic bombs and promised to send participating children a button “to wear showing his or her contribution to science.” Ursula Franklin Fonds, B1996-0004, Box 41, Folder 2, University of Toronto Archives.

Figure 2. Fallout graphs by Ursula Franklin. On left, a graph that appeared in the VOW radiation brief showing the fallout data from New Brunswick by month, 1962. At right, a hand-drawn bar graph by Franklin from Alberta by month, 1962. These graphs show the extensive data collection done by Franklin and her careful visual data analysis, as well as the varied fallout patterns in different parts of Canada. Franklin Fonds, B1996-0004, Box 41, Folder 1, and Box 42, Folder 2, University of Toronto Archives.
In June of 1963, VOW published the brief “Fallout Monitoring in Canada” and submitted it to the Minister of National Health and Welfare (Figure 2). The brief made several demands for the Minister regarding fallout monitoring in Canada, arguing that Canada did not meet international standards. They asked for a clear definition of government agency responsibilities, an extended fallout monitoring system, for the delegation of monitoring to the provinces, the publication of fallout information with “sufficient interpretation to be meaningful to the concerned citizen,” and installation of decontamination technology in dairies.\textsuperscript{118} As the primary author, Franklin expressed concerns about the government’s fallout monitoring, framing her argument in terms of citizenship. She wrote, “The Canadian citizen does not know whether his government seeks or receives advice on radiation health matters from sources outside the federal civil service … It also does not seem to be known publicly who is responsible for the enforcement of any such standards.”\textsuperscript{119} VOW’s primary concern lay in the lack of government responsibility for public health and rights of citizens to know what threats radiation posed. In a letter, Helen Cunningham praised Franklin’s work: “I still dream of the day when VOW will produce a political statement approaching the quality of your brief.”\textsuperscript{120}

Despite Cunningham’s distinction, it would be faulty to categorize this scientific report as non-political, especially as Jo Davis attacked Franklin for her “scientific” stance and supposed “objectivity.”\textsuperscript{121} Indeed, correspondence that surrounded the brief’s publication indicates that VOW members held the research to be utterly political. In letters to one another they debated the best ways to publicize their findings, which sympathetic news reporters to alert, and which level

\textsuperscript{118} “Fallout Monitoring in Canada: Brief to the Minister of National Health and Welfare,” 1963, p. 2-3, Box 42, Folder 2, B1996-0004, UMFF-UTA.
\textsuperscript{119} “Fallout Monitoring in Canada: Brief to the Minister of National Health and Welfare,” 1963, p. 2, Box 42, Folder 2, B1996-0004, UMFF-UTA.
\textsuperscript{120} Helen Cunningham to Ursula Franklin, May 20, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
\textsuperscript{121} As Olga Kuchinskaya argues, making invisible hazards visible is a political act. Olga Kuchinskaya, “Citizen Science and the Politics of Environmental Data,” Science, Technology, and Human Values 44, no. 5 (2019).
of government should be responsible for radiation testing. Franklin, as the object of Davis’s “smear” campaign, explained her desire to finish the report by noting that she had “no intention to continue being a dangerous influence in VOW. Nor do I wish to turn the movement into a Communist outfit [...] I would like to get this done as soon as possible.”

Such letters show that individuals in VOW knew the political potential of claiming the right to produce scientific knowledge. Their notes also indicate they were acutely aware that women were not permitted the same access to rational, technoscientific citizenship as men. Members insisted on removing any “emotionalism” from their presentations, not wanting to show “hysteria or emotion from women.” The radiation brief also directly dismissed women’s supposed incapacity to enact rational citizenship practices. Franklin rejected the concern that monitoring would create “panic and undue emotional reactions, particularly among mothers,” pointing out that women had recently “absorb[ed] the facts of a whole new science of nutrition” and so must also be capable of grasping “the basic facts and implications of radiation contamination, if those facts are presented to them in a spirit of honesty and co-operation.” In her brief, Franklin claimed the right to produce technoscientific knowledge of radiation threats. She also insisted that this political identity would not, necessarily, overturn Cold War domesticity. Indeed, she suggested that women could easily assume rational, efficient domestic practices to care for their families and the nation if given the right expert advice.

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122 See letters in Box 42, Folders 5 and 6, B1996-0004, UMFF-UTA.
123 Franklin to Helen Cunningham, May 31, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
124 Franklin to Dr. Langston, May 27, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
125 As Tarah Brookfield has suggested, the women involved in VOW were highly aware that their position as women made their scientific critiques of the dangers of radiation open to the charges of gendered emotionalism. Brookfield, Cold War Comforts, 72.
126 Betty Marsh to Ursula Franklin, January 10, 1963, Box 42, Folder 5, B1996-0004, UMFF-UTA.
127 Aileen Powers to Ursula Franklin, January 22, 1964, Box 41, Folder 9, B1996-0004, UMFF-UTA.
128 “Fallout Monitoring in Canada: Brief to the Minister of National Health and Welfare,” 1963, p. 4, Box 42, Folder 2, B1996-0004, UMFF-UTA.
Women working on fallout activism insisted that the material effects of radiation would disproportionately affect themselves and their children. Strontium-90, Iodine-131, and Cesium-137 were all particularly harmful to pregnant women. The thyroid of a fetus, Diana Wright explained, “is highly sensitive to radioactivity, and the very small amount [of Iodine-131] that might reach it might have the effect of destroying the thyroid, without which a child cannot develop either mentally or physically….Strontium 90 affects the bones of the infant more than the grown person … and furthermore, it seems that Canada is, geographically, more apt to receive high levels of fallout than either the US or the UK.” Franklin made similar arguments in her radiation brief to Parliament.129 It was not just women’s bodies that would be affected by fallout, but their domestic duties as well. Diana Wright had several long conversations with health officials, insisting that they must take pro-active steps to ensure at-risk members of Canada’s population would receive powdered milk in the case of a fallout emergency. One doctor replied that such worries were the purview of Ottawa, as they would be the ones to know an increase in fallout was due to a single test, with “minor exposure,” in which case “it might be better to keep it in reserve until the situation became ‘really serious’” such as fallout that might result from “a series of explosions.”131 Concerns over how to take preventative measures – what kind of milk to give

129 Diana Wright to VOW Provincial Executive Members and Regina Executive, December 19, 1962, Box 42, Folder 5, B1996-0004, UMFF-UTA.
130 Wright, in fact, received information from Franklin to include in the VOW Saskatchewan’s brief to the Provincial government, which they submitted in January 1963, nearly half a year before Franklin finished her own brief. VOW Saskatchewan, Press Release, January 4, 1963, Box 41, Folder 4, B1996-0004, UMFF-UTA. Wright sent this to Franklin, writing: “Hope you find brief up to required standard.”
children, what grains, whether these were all poisoned from fallout in ways that would not be apparent immediately – directly affected women’s citizenship responsibilities.

VOW activists juggled political organizing with continued home duties. Franklin, who noted that her “family and … work ha[d] suffered”\textsuperscript{132} due to her research, was not alone. Helen Cunningham wrote to Franklin: “Apologies for this jumble -two kids with sore throats crawling all over.”\textsuperscript{133} Macpherson recalled that “Sometimes [activism] was disruptive to home life. Some men, coming home to find children parked with the neighbors and a note saying, ‘Hot dogs in fridge. Please bath Johnny. There’ll be 20 women stuffing envelopes at 8. Love, B,’ found it a bit hard to cope. Though the women were increasingly involved, effective, and happy, some men just couldn’t take this unconventional, independent type of wife, and some separations and divorces ensued.”\textsuperscript{134}

The women’s claim to speak for all women and children mirrored claims they made about the permeability of national boundaries to radiation threats. As they declared at their second annual meeting in 1963, “the air and soil and water of this earth belong to us all and no nation has any right whatever to pollute them, we therefore unite in deploring all nuclear tests of whatever kind, whether carried out by the U.S.A., the U.S.S.R., or any other nation, and we demand that they should be stopped and a test ban treaty be signed at once.”\textsuperscript{135} In their insistence that the earth “belongs to us all,” these women invoked novel conceptualizations of property. For the political theorist C.B. Macpherson, property is an institution and a set of ideas, both of which change over time. In its essence it is political, for it requires relationships between people. A

\textsuperscript{132} Franklin to Helen Cunningham, May 31, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
\textsuperscript{133} Helen Cunningham to Ursula Franklin, May 30, 1963, Box 42, Folder 6, B1996-0004, UMFF-UTA.
\textsuperscript{135} Second Annual Meeting minutes, September 1962, Box 38, Folder 1, B1996-0004, UMFF-UTA.
system of property, writes Macpherson, is “a system of rights of each person in relation to other persons.” Indeed, the novel aspects of the radiation study were not only that they insisted on federal action but that they re-imagined citizen rights in the face of national boundaries made permeable by material forces. VOW’s citizenship demands rested on concepts of common property and common rights to unpolluted bodies and worlds.

Looking at the heated debates over Franklin’s radiation brief reveals that claiming the right to produce technoscientific knowledge was essential for VOW’s move away from maternal politics and towards a New Left politics and an embrace of multivocal feminist identities. In detailing radiation hazards, they insisted women were not just emotional mothers but rational citizens, able to participate in political technoscientific decisions. Their claims to citizenship, however, rested specifically on white femininity. As Joan Scott has argued, “man and woman are at once empty and overflowing categories. Empty because they have no ultimate, transcendent meaning. Overflowing because even when they appear to be fixed, they still contain within them alternative, denied, or suppressed definitions.” In the Voice of Women, Jo Davis’s insistence on “moderation” brought discussions of women’s difference to the fore, even while VOW continued to advocate on the behalf of all women, as women. In the United States, difference confronted Women Strike for Peace when African American women’s actions demonstrated the impossibility of a singular womanhood.

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137 Tarah Brookfield shows that technoscientific identities were essential to full citizenship when she describes the ways the Minister of Health and Welfare Judy LaMarsh rejected their political arguments as “VOW’s gendered motivations made them unsuitable partners in research.” Brookfield, *Cold War Comforts*, 72.
138 Scott, *Gender and the Politics of History*, 49.
Women Strike for Peace, Race, and Women’s Difference

Much like VOW, women formed Women Strike for Peace (WSP) as a women’s peace organization to speak against Cold War nuclear politics. Intended as a single march (held November 1, 1961, with over 50,000 participants), WSP soon grew into an organization that continued to agitate for peace and nuclear disarmament over the 1960s and after. In 1962, WSP held its first annual conference in Ann Arbor, Michigan. Hundreds of white women attended, who “were chiefly wives, mothers and workers, active in community and professional fields,” as Elsa Thompson reported back to the San Francisco Women Strike for Peace.

Questions of racial and economic justice thread through Thompson’s notes on continuing “ban the bomb” work and support for the United Nations. She described discussions about the ways peace was not just the “absence of war,” and “this showed itself in several ways during the meetings as questions came on to the floor which raised the issues of civil rights, racial segregation, economic justice, political equality and international friendship. Can you have peace without them?”

More strikingly, Thompson recalled a confrontation when African American members from Detroit were at first refused entry to the conference, as they had insisted on carrying “Desegregation, Not Disintegration” signs at a WSP rally. Thompson’s notes are worth quoting at length as they give voice to demands for racial justice made by Black attendees. Thompson wrote,

139 For the seminal monograph on WSP, see Swerdlow, Women Strike for Peace.
140 Elsa Knight Thompson, “My personal impressions of the Ann Arbor Conference,” Carton 3, Folder 28, San Francisco Women Strike for Peace (MSS89), Bancroft Library, University of California – Berkeley (hereafter SFWSP).
141 As Vincent Intondi has shown, civil rights activists had for decades linked antinuclear, antiwar, decolonization to their own work fighting for rights within the United States. Swerdlow, Women Strike for Peace, 90-92; Vincent J. Intondi, African Americans against the Bomb: Nuclear Weapons, Colonialism, and the Black Freedom Movement (Stanford, CA: Stanford University Press, 2015), 70; Estepa, “Taking the White Gloves Off.”
The view of the four women to whom we extended the special invitation was (as far as I could gather) this – that repeatedly the middle class whites have said in effect – you come with us on this issue and when that’s done then we will help you get justice – that we only want them with us in order to use them, that we, in fact, prefer only middle class Negroes when we do include them, that we ignore and in truth do not want to face the real implications of the status of the majority of the Negroes either domestically or as it affects our position as a nation in relation to the rest of the world, that any Negro who lets himself or herself be so ‘used’ by the whites is suspect within his own community, that for them social justice must come first and any participation in a movement which refuses to openly state its stand on this issue will have no appeal to the majority of the Negroes. Uncompromising? Yes, perhaps, but also very disquieting at a very deep level … I have rarely seen people probing for the truth – their own truth, inside them, more honestly.  

The issue of civil rights deeply affected Thompson. She wrote in her report of one woman, “with a face that is vivid when it lights up but in repose has a somber wary cast with pain deep in the eyes,” who spoke to the group, saying “You see we feel that if the next hundred years are going to be like the last, we don’t care whether there is peace or not.” “It hit me like a physical blow,” continued Thompson, these issues “are worthy of much thought and discussion if we are to grow into a representative nationwide movement.”

As Andrea Estepa has shown, many WSP groups did, in fact, extend their reach beyond middle-class white women. While the stirrings of what VOW member Jo Davis would call “radical” activism were present in the early 1960s – in response to civil rights and the Québécois independence movement – the emergence of other social movements in the middle of the 1960s began to erode women’s ability to claim maternalism as a shield against accusations of political radicalism. Vietnam brought the militarization of the Cold War into people’s homes through

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142 Thompson, “Personal impressions,” Carton 3, Folder28, SFWSW. Estepa quotes Shirley Sapin from the New England Voice of Women recalling that “it was very poignant because in effect it helped many of us people there, white people, recognize that no effort had been made around the injustice and the racist society in which we were living.” Estepa, “Taking the White Gloves Off,” 91.

143 Thompson, “Personal impressions,” Carton 3, Folder28, SFWSW.

144 Estepa, “Taking the White Gloves Off”; Loyd, Health Rights Are Civil Rights, Chapter 4.
television broadcasts, through incessant reports of death, and through the invocation of ecocide.\textsuperscript{145} VOW and WSP members were early anti-war protesters and their alliances with individuals who could not claim white domesticity as proof of moderate social goals pushed these women further into radical political work.\textsuperscript{146}

Citizenship shifted throughout the 1960s in the United States. For historian Lawrence Wittner, the peace movement provided the grounds to change women’s place in politics, allowing them a voice in public.\textsuperscript{147} VOW and WSP members had crafted novel political identities based on their ability to speak in public about technoscientific decisions that they felt affected all people. This public stance was not based solely on maternal femininity (which relegated women to the private sphere) but neither did it reject women’s care for the home completely. Women’s attempts to distance themselves from white, middle-class domesticity – as seen in Black women’s insistence that their civil liberties were a prerequisite for peace and in Franklin’s embrace of women’s scientific acumen – had only grown by the end of the decade. In countercultural revolutions and the women’s liberation movement home became not a place that could enable women’s technoscientific citizenship but a place to be rejected entirely.

\textsuperscript{145} Women in WSP came to intimately know the ways ecocide did not affect all bodies in the same way through their direct communication with Vietnamese women. As Jessica Frazier has argued, American women sought to end the war through maternal rhetoric that did not only construct white motherhood but also reworked Vietnamese women into idealized forms. While historians have argued that scientists’ political work united environmental devastation with international security threats, it was also women’s transnational communications that brought the knowledge of these connections to people in the United States. I would love to make an argument about the ways these women constructed scientific knowledge about ecocide in this dissertation. However, I believe that is beyond the source material I have. Frazier, \textit{Women’s Antiwar Diplomacy During the Vietnam War Era}; Neil S. Oatsvall, “Trees Versus Lives: Reckoning Military Success and the Ecological Effects of Chemical Defoliation During the Vietnam War,” \textit{Environment and History} 19 (2013); David Zierler, \textit{The Invention of Ecocide: Agent Orange, Vietnam, and the Scientists Who Changed the Way We Think About the Environment} (Athens: University of Georgia Press, 2011).

\textsuperscript{146} This is the main argument in Estepa’s work. Estepa, “Taking the White Gloves Off.”

\textsuperscript{147} Lawrence S. Wittner, “Gender Roles and Nuclear Disarmament Activism, 1954-1965,” \textit{Gender and History} 12, no. 1 (April 2000).
Conclusions and Beginnings: Reworkings of Cold War Domesticity in Counter-Conduct Technology Movements

If the home was a space of Cold War cultural and economic hegemony, it could become a site of revolution. As Donna Haraway and Jaye Miller wrote in 1970, “We hope that men can once more learn to appreciate the world as a home … A new home must be public as well as private … our effort would be to create a mutually supportive public home in which men and women would participate as equals in public reasoning.” Haraway and Miller directly implicated home in women’s relationship to “public reasoning.” While written nearly a decade after Franklin’s radiation brief, framing home in this way resonates with VOW activism. In the early 1960s, women used domesticity and women’s bodily relation to radiation hazards to insist governments act to protect their citizens. In the process, they made homes into spaces of public concern and expanded women’s technological citizenship.

Yet in many ways, the re-imagining of home in the late 1960s bore little resemblance to the home invoked by VOW and WSP. Over the course of the decade, domesticity itself had shifted, with the erosion of Cold War domesticity and the arrival of cultural rebellions across the globe intent on making the home into a site of radical social and political change. In global countercultural revolutions, people rejected dominant ideologies, upending post-war assumptions.

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of work, family, and individual perception. Rejecting hegemonic gender norms was crucial to this activism. 149

But at the same time, as Haraway and Miller suggested, domesticity as a form of “counter-conduct” proliferated, with women and men assuming various material lifestyles as a form of politics. 150 Take River, a woman who was part of and documented a Californian counterculture architecture community, who was once “known as Sally Barnes Shook, wife in a dissolving marriage, despairing mother of three almost totally-gone-native sons” but became “a proud, stubborn, golden-tousled-haired passionate woman fighting flat out for her freedom.” 151 According to River, “I have wished to do my part in caring for our earth ... I moved to the country.” 152

Metaphors of earth also proliferated alongside gendered practices, as River’s account intimates. “Spaceship Earth,” Gaia, the environment, and “Limits to Growth” joined fallout in constructing global space. Much like radiation flows, many of these ideas of earth emerged from concerns over human-caused, detrimental change to soil, air, and water. And much like fallout, these geographic imaginaries come to be known through the space of the home.


150 Michelle Murphy uses the term “counter-conduct” to describe the ways activists rework practices. Murphy, Seizing the Means of Reproduction. According to Andrew Blauvelt, “In their struggle to create a new social, cultural, political, and ecological utopia, the counterculture expressed its political activism and activated its cultural radicalism in new and imaginative ways. By doing so, they created a new sensibility or aesthetic in the broadest sense. It is this sensibility that I’ve described as a hippie modernism - an aesthetics of refusal - one that rejects the given parameters of a practice, obviates the boundaries of a defined field, or alters the course of an instrumental technology.” Here, and for other scholars of the counterculture, the material practices stand as essential to political and social transformations. Blauvelt, “The Barricade and the Dance Floor,” 26.


152 River, Dwelling, 2.
In the next chapter, I turn to grassroots activists who engaged in counter-conduct by constructing technoscientific solutions to the social, ecological, and cultural devastation they saw occurring around them. These activists can be, in the broadest sense, categorized as part of the Appropriate Technology (AT) movement, which spanned the late 1960s through the late 1970s. AT promoted “small-scale” tools, decentralized social and political structures, technologies adapted to specific cultural and ecological needs, and local economies. This movement can be connected to the work of WSP and VOW not only in a genealogy of technoscientific activism, but also because women from earlier organizations carried their pacifism and antinuclear work into AT activism.153

The people in AT merged domesticity with a critique of scientific progress and technological beneficence. They made scientific and technological change central to their critique of politics, economics, and society. While they also produced scientific knowledge, they did so in ways that rejected concepts of objective observation and rational citizenship, looking instead to situated knowledge-making practices that incorporated personal experience.154

154 There is considerable literature on feminism and subjective knowledge-making practices. See work by Donna Haraway and Michelle Murphy.
CHAPTER 3

“AN EARTH ETHIC MAY WELL HAVE TO BEGIN WHERE WE LIVE”: TECHNOSCIENTIFIC CITIZENSHIP AND ECOLOGICAL DOMESTICITY IN APPROPRIATE TECHNOLOGY

“An earth ethic may well have to begin where we live. If this is so, our houses should emulate the workings of nature.” – John Todd, “The New Alchemists,” *Co-Evolution Quarterly*

By the time John Todd wrote an article about his group, the New Alchemy Institute, for the *Co-Evolution Quarterly*, “earth” and “where we live” had shifted dramatically from the Cold War domesticity of the early 1960s. Homes had become places to rebel against dominant ideologies that linked progress to large-scale technologies, scientific exploration, and economic growth. Simultaneously, interdependence based on radioactive fallout had been joined by another form of planetary connection: the “Spaceship Earth.” Scholars recognize the emergence of finite resources on a limited planet as integral to international politics of the 1970s. Decolonization was “the central geopolitical dynamic structuring the meaning of the global environment.”

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156 Sabine Höhler credits Kenneth Boulding with the term “Spaceship Earth” in a 1966 lecture. Other forerunners of the concept include Buckminster Fuller, Barbara Ward, and Rene Dubos. I draw on Höhler’s framing of the “spaceship earth” built upon ideas of circulation, territory, and capacity. Höhler, *Spaceship Earth*, 17.
of nations taking control of resources for sovereign economic development. This “Age of Limits” suggested that finite energy and resources, alongside rising human population, would lead to social and political collapse.

Concerns over resources were largely connected to questions of “development,” as major economic and political transformations gained momentum in the 1960s. Alongside decolonization, international economic fluctuations and the declining value of the dollar led to the end of the Bretton Woods system in 1971. This sparked a decade of economic transformation that included unemployment, inflation, stagnant productivity, shifting centers of industry, and increased national economic uncertainty. How to “progress” into modern economies could not be understood without discussion of technological change. Increasingly, economic development came into conflict with those who saw “careless technologies” destroying ecological systems.

Appropriate Technology (AT) emerged in the Global North in the late 1960s as people tried find ways to “live lightly on the earth,” in poet Gary Snyder’s well-worn phrase, by designing ways to be self-sufficient in food, energy, and shelter. Their techniques included recycling, insulation, passive solar, organic gardening, bicycling, and composting, to name a just a few. They argued that these “small-scale” technologies would reduce human impact on the

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159 Several histories of the United Nations Conference on the Environment, held in Stockholm in 1972, highlight the increasing tensions between development and ecological protection. Macekura, Of Limits and Growth, Chapter 3; Scott, Outlaw Territories, Chapter 3.
160 As Timothy Mitchell argues, “development” came to replace colonial rule, as “the great advantage of the doctrine of self-government or self-determination, in contrast to the arguments for democracy, was that the self to which it referred was very weakly defined.” International governance thus deferred non-European claims to self-government through various ideas of “development” by claiming former colonies were still “in need” of it. Mitchell, Carbon Democracy, 82.
162 This is the central tension described by Macekura, Of Limits and Growth. For careless technology, see Farvar and Milton, The Careless Technology.
163 For Gary Snyder’s relationship to concepts of bioregionalism, see Thomson, The Wild and the Toxic, Chapter 3.
earth, provide meaningful work, and support decentralized participatory democratic practices in contrast to either political option dominant at the time (Figure 3). As one activist argued, “In the past, ecology embodied an alternative to mainstream political action ... the assemblage of technological apparatuses was viewed as a liberating toolset for the individual ... self-sufficiency was understood as a political statement against consumerism and capitalism.”164 Indeed, the AT movement provided a bridge between the radical science movement that critiqued the production and use of technoscience and the increasing concerns over high-consumption ways of living that led to ecological devastation.165

This chapter looks at the ways people who saw themselves as part of AT constructed forms of “counter-conduct” through the pages of “access catalogs.” These publications included comments from readers, book reviews, and instructions for how to build your own geodesic dome, start a food cooperative, or organize information. Through the pages of these catalogs, readers came to recognize specific technologies as ways to care for the earth; readers could then also recognize people who performed those actions as enacting new political identities.166 The technoscientific citizenship embodied in these publications did not make demands for state

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165 Most historians treat these movements as two separate phenomena. See Hays, Beauty, Health, and Permanence. For AT as radical science, see Elliott, “The Alternative Technology Movement.”
166 I draw on Michelle Murphy’s concept of “protocol feminism” for the idea of shared instructions for environmentalism. Murphy, Seizing the Means of Reproduction. This formulation of also citizenship draws on Hannah Arendt’s concept of processual politics. What Arendt terms “action” requires an individual being heard and seen by others. As Arendt writes, “It is the space of appearance in the widest sense of the word, namely, the space where I appear to others as others appear to me, where men exist not merely like other living or inanimate things but make their appearance explicitly.” For feminist scholar Sherilyn MacGregor, following Arendt allows her to argue “that it is when people act politically and appear as citizens in public that they are allowed to express ‘who’ they are, to realize their human distinctness.” Arendt, The Human Condition, 177; MacGregor, Beyond Mothering Earth, 72.
regulation but saw individual empowerment as the basis for renewed democracy: self-sufficiency could “open up the kind of freedom which could lead to stewardship.”

Figure 3. “Another Way.” This cartoon presented self-sufficiency and living with nature as an alternative to capitalism or communism.

Additionally, these activists promoted what I call ecological domesticity, the formation of specific social relationships and material practices intended to care for the earth through care of the home. Transforming homes became one solution to the linked problems of economic and ecological limits to growth. By imagining home “as being a microcosm of the macrocosm it is set in,” homes could change society and human’s material impacts.\textsuperscript{168} While scholars have addressed AT’s environmentalism, politics, and technological critique, they have not dealt with the centrality of gender and domesticity in the work of these activists.\textsuperscript{169}

While scholars have discussed gender issues in technological change and energy transitions in the Global South, they remain obdurately silent in the history of AT in the North.\textsuperscript{170} Yet neutered energy transitions become by default masculine if the promise of political independence, technological innovation, and scientific citizenship are again placed in white, male hands. Without critique, scholars embrace terms of “pioneers” and “bricoleurs,” both replete with overtones of masculine and racial identities. Promises of personal autonomy, just like the regionalism and agrarianism they were built upon, rested on hierarchies and histories of


\textsuperscript{170} See, for example, Anke Maria Mueller and Dishna Schwarz, “Making Micro Hydropower Projects Contribute to Gender Equality,” \textit{Appropriate Technology} 39, no. 3 (September 2012).
racial and gendered difference. Property, self-sufficiency, and technological acumen were all the domain of masculinity and male citizenship. Historians unintentionally continue this in their inability to write women into such narratives. The absolute lack of attention to African American AT groups highlights the whiteness at the heart of these conceptions of technological citizenship.

AT groups made claims that their technologies could free all people, but their work, in fact, unintentionally reified existing racial and gendered political subjects. The homes they depicted in their catalogs were white, middle class, heteronormative spaces, and thus their claims of earthly holism rested on specifically gendered and racial identities enacted through domesticity. AT’s vision of stewardship proved paradoxical although they envisioned that producing scientific knowledge in homes would overturn existing hierarchies, the result was instead affirmation of masculine citizenship based on scientific and economic independence.  

“Tired of Watching the Erosion of Life, Natural Resources and the Economy”: Emergence of Appropriate Technology

Historians link the emergence of AT to E.F. Schumacher’s writings on local economic development in an international context. Drawing from Gandhian self-sufficiency and control over production, Schumacher brought his work to an international audience through conferences (most prominently articulated at a conference at Oxford in 1968) and through his seminal 1973 book, Small is Beautiful: Economics as if People Mattered. Such “technological choice,” as E.F. Schumacher and historian Kevin Willoughby frame it, was intended by AT to overturn the economic and political hierarchies that prevented “developing” nations from reaching economic

171 As Barbara Omolade argues, whiteness and scientific acumen directly disenfranchise people of color, specifically women. She writes, “Western man’s whiteness, imagination, enlightenment science, and movements toward peace have developed from a culture and history mobilized against women of color ... This technological and material progress has been in direct proportion to the undevelopment of women of color.” Barbara Omolade, “We Speak for the Planet,” in Rocking the Ship of State: Toward a Feminist Peace Politics, ed. Adrienne Harris and Ynestra King (San Francisco: Westview Press, 1989), 173.
parity with the “developed” countries, while maintaining a diversity of ecologies and cultures. While organizations such as Schumacher’s International Technology Development Group (1966) aimed to aid “underdeveloped” nations, concerns over “overdevelopment” soon joined these technological debates.\textsuperscript{172}

Concepts mirroring Schumacher’s “intermediate technology” emerged from the 1960s counterculture, epitomized by the 1968 publication of the \textit{Whole Earth Catalog}. The authors intended this publication to be a source of “information” for people looking to “live more lightly upon the earth,” reaching individuals who felt their economic and political world crumbling and wanted to do something about it. As one news story argued,

They had become tired of watching the erosion of life, natural resources and the economy. They decided there had to be a reasonable answer to the increasing pressures of life and the demands of a spiraling inflation. They talked about a bleak future for the affluent society and the great ‘American Way of Life.’ Unless something was done to restore a sense of economic and natural balance, the outlook was dismal. They were fed up with paying high taxes, high utility bills, gas bills, food bills. They agreed the answer was ‘back to nature.’\textsuperscript{173}

AT combined radical science with construction of alternatives to what they saw as destructive technologies that produced food, energy, and shelter. In food production, they pointed to the capital- and energy-intensive agricultural practices that made use of the post-war boom in pesticides and herbicides.\textsuperscript{174} They were largely antinuclear activists, critiquing the

\textsuperscript{172} Willoughby, Technology Choice. According to Schumacher, “technological choice” was necessary as “different economic and social conditions demand different applications” but “knowledge of scientific laws ... is, in a sense, absolute.” E. F. Schumacher, “Alternatives in Technology,” \textit{Alternatives} 1 (1975): 17. Michael Adas, an historian of science, wrote that “But the makings of a middle way between these untenable options may be found in the increasing emphasis given by development specialists to projects that in scale and the nature of their technological input are attuned to the community needs and ecological constraints of the local areas where they are introduced. This search for ‘appropriate technologies’ offers the possibility of approaches to development that are independent of those followed by either the West or the Soviet Union.” Michael Adas, \textit{Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance} (Ithaca: Cornell University Press, 1989), 417.


potential harm of nuclear power and the concentrations of political and economic power such technologies allowed. Many participated in antinuclear activism before and after their engagement with AT.\textsuperscript{175} In housing, they were concerned with both the seeming disintegration of urban spaces and suburban sprawl that epitomized the endless consumption of the natural world.\textsuperscript{176}

In this chapter and throughout this dissertation, I primarily focus on those who took ecological processes as central to their technological work. They imagined homes as replicating ecological processes and believed homes needed to be seen as part of ecosystems. They drew inspiration from whole systems research, particularly the concept of Gaia developed by James Lovelock and Lynn Margolis.\textsuperscript{177} These activists constructed what is now called ecological design: incorporating ecological processes into architectures and technologies.\textsuperscript{178}

The variety of groups that contributed to this form of activism makes it difficult to categorize. AT included individuals publishing information about their own experiments in adding insulation to their home. It included those often associated with the back-to-the-land movement, like Steve and Holly Baer’s Zomeworks.\textsuperscript{179} It included college classes like those led by Sim Van der Ryn at UC Berkeley or the Ouroboros project at the University of Minnesota. It included bioregionalists like Peter Berg and Judy Goldhaft, who practiced life-acting and were

\textsuperscript{175} Lemke-Santangelo, interview.
\textsuperscript{178} Anker, \textit{From Bauhaus to Eco-House}.
\textsuperscript{179} For an overview of the many kinds of AT, see Borasi and Zardini, \textit{Sorry, Out of Gas: Architecture’s Response to the 1973 Oil Crisis}. 

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part of the San Francisco group the Diggers.\textsuperscript{180} It included scientists looking for other ways to conduct science, like John Todd, William McLarney, and Wes Jackson. It included biologists, antinuclear activists, artists, and those who had worked in development abroad. It included government programs and international development agencies.\textsuperscript{181} As critic Witold Rybczynski, wrote, “what a strange set of traveling companions one found: well-dressed World Bank economists rubbing shoulders with Gandhians in metaphorical, if not actual dhotis; environmentalists, Utopians, and \textit{bricoleurs}; conventional politicians like President Jimmy Carter and less conventional politicians like Governor Jerry Brown of California ... The American National Academy of Sciences had recognized AT and, more importantly, so had the United States Congress.”\textsuperscript{182} Most broadly, the ways people met “basic human needs” (such as food, energy, and shelter) came to be of central concern for most AT groups.\textsuperscript{183}

What held this diverse movement together was the shared idea that control over technological choice provided the grounds for economic and political power.\textsuperscript{184} As one AT sourcebook put it, “Appropriate technologies can be simply defined but not so simply created. They are small in scale, conservative of resources, controllable, and wise. They extend and deepen our own capabilities and experiences and unify them with those of others and with our

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\textsuperscript{180} Judy Goldhaft, interview by Emma Schroeder, November 14, 2019.
\textsuperscript{183} Macekura, \textit{Of Limits and Growth}, 151.
\textsuperscript{184} Langdon Winner’s work remains some of the best analysis of these ideologies. Winner, \textit{The Whale and the Reactor}; Winner, “The Political Philosophy of Alternative Technology.” David Elliott discusses this movement as an “early green radical challenge.” Elliott, “The Alternative Technology Movement.” Ryan Tate argues that control over technology leading to political power was one way in which AT moved into the mainstream. Ryan Tate, “Rural Revolt: Power Line Protests and the Alternative Technology Movement in the United States, 1970s,” \textit{Technology and Culture} 62, no. 1 (January 2021).
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surroundings.”¹⁸⁵ They embraced the “soft” technologies of social relationships and cultural beliefs, including “all the conceptual, organizational, political, physical and spiritual tools and techniques which we bring into play by our actions.”¹⁸⁶ Technological change would fail without a concurrent alteration in social relationships of power. Rather than the protest politics of the 1960s and early 1970s, environmental historian Andrew Kirk suggests that AT turned to “material things, invention, and scientific expertise”¹⁸⁷ as political interventions. Ultimately, AT activists saw “autonomy from the grid of supplies as an ecological and libertarian way of living and acting.”¹⁸⁸

In embracing material independence as the key to political independence, they easily fit into a long tradition of US political thought. Jordan Kleiman has discussed the centrality of regionalism, populism, and Jeffersonian agrarianism to the politics of AT advocates.¹⁸⁹ The promise of informed, independent citizenry rested on economic independence. As Schumacher wrote, “The greatest deprivation anyone can suffer is to have no chance of looking after himself and his family and making a livelihood.”¹⁹⁰ While discussion of property ownership rarely inflected AT literature, they saw control over energy, food, and shelter as essential tools for personal liberation from oppressive structures of modernity.¹⁹¹ In line with their adherence to

¹⁸⁶ De Moll, Rainbook: Resources for Appropriate Technology, 2.
¹⁸⁸ Kallipoliti, “From Shit to Food,” 89.
¹⁹¹ For instance, although the New Alchemy Institute lost land once due to rental agreements and property values, and almost lost land again a decade later, they never turned to a critique of property relationships. There were some exceptions to avoiding property in AT work, including Judy Goldhaft and Peter Berg. The most prominent of these
meaningful, independent labor, rather than rely on expertise and knowledge constructed elsewhere, catalogs insisted that all people could be part of producing scientific knowledge. They also wanted to overturn the dominance of western science, looking for technological solutions from around the world. Or as Susan Ervin insisted, “it wasn’t decentralization in every area. It was a human scale life lived with justice.”

The nation-state did not form the boundaries of AT citizenship. Instead, activists imagined the entirety of the earth as a space for public life and personal care. As one organization put it, they were driven by a “continuing awareness of the inter-relatedness of all economics, energy and agriculture to the finite planet we seem bent on exhausting.” Others asked “How can we float into a sense of place (which is sometimes associated with tradition, provinciality, conservatism) and simultaneously comprehend our relation to a ‘global village’ and the earth?” Earthly connection required personal responsibility. As John Todd, member of the New Alchemy Institute, wrote, “The future must touch all of us, for it is within our power as individuals to counter so many things including the continuing loss of biological diversity and

was the “open land” movement in California, as they rejected building codes and insisted on free land. As Felicity Scott contends, “Open Land thus also implicitly questioned the relation between the state’s more benevolent role in ensuring the health and welfare of its citizens and the forms of control it exerted over them in the name of maintaining productivity, or more precisely, maintaining profitability for the capitalist machinery.” Scott, Outlaw Territories, 111.

Much more needs to be written about the incorporation of non-western technologies. As Gretchen Lemke-Santangelo explained, “We also did a lot of reading about what was happening in the third world, so we were very interested in, without knowing what we later knew, about Mao’s cultural revolution, and what was going on in Cuba, the appropriate technology movement began, really, as a third world development movement that that older development models were not adapted to local communities and their resources bases and environmental constraints and were not user friendly. So, so we were not just biogregionalists, we were globalists in that sense.” Lemke-Santangelo, interview by Emma Schroeder, August 5, 2018

Susan Ervin, interview by Emma Schroeder, February 24, 2017.


De Moll, Rainbook: Resources for Appropriate Technology, 11. As Fred Turner notes, these tools were intended to “serve the local needs of their users and, ultimately, planetary health.” Turner, From Counterculture to Cyberculture, 125.

This, of course, was rejected by people in Global South. The limits to growth were seen as a way of preventing economic power from accruing to developing nations. Additionally, current movements for climate justice and racializing planetary imaginaries have shown that not all people, but specific people, are responsible for ecological devastation. Holism, the whole earth, can prevent seeing the unequal effects of imperialism and capitalism.

AT, however, never existed as a unified social, political, or cultural movement.\footnote{199}{See Willoughby for diverse definitions of AT. Willoughby, \textit{Technology Choice}.} It divided between those in developing countries (who saw it as another avenue of economic growth) and developed countries (who embraced a limits-to-growth mentality).\footnote{200}{Rybczynski, \textit{Paper Heroes}, 29-30.} AT also fell apart as proponents carried different social goals and differing expectations of change through technological revolution. Some saw ecological design as placing nature “first,” “ingor[ing] and slight[ing]” matters of justice. Folks who worked in alternative technology may have embraced technological change but without the “socialist” bent of “radical” technology.\footnote{201}{Valentina Borremans, \textit{Guide to Convivial Tools} (New York: Library Journal : Available from R.R. Bowker Co., 1979), 5.} The inclusive tent of AT opened advocates to contemporary criticism, especially in their suggestions that technological change resulted in social and political transformation. Indeed, the sense that insulating one’s home could lead to political empowerment had to be constructed. AT proponents built this link through publications, including instruction manuals, directories, and personal accounts.

**Technoscientific Citizenship and Ecological Domesticity**

AT, as it emerged from New Left politics and other critiques of society, rested on individual self-sufficiency connected to community support and global citizenship.\footnote{202}{Scholarship on the 1960s counterculture is vast. For a beginning, see Peter Braunstein and Michael William Doyle, eds., \textit{Imagine Nation: The American Counterculture of the 1960s and ‘70s} (New York: Routledge, 2002); Suri, “The Rise and Fall of an International Counterculture, 1960-1975.”; Colin M. Coates, ed. \textit{Canadian Countercultures and the Environment}, Canadian History and Environment Series (Calgary, Alberta: University of}
may not have been cohesive, in the pages of AT publications specific forms of technoscientific citizenship took shape. Linking specific technologies – composting toilets or passive solar houses – to concepts of social justice required a shared communicative space. It also required readers to actively engage in the information such “access catalogs” provided. AT took shape not only through political ideologies or technological instruction manuals, but in people reading and acting on what they had read.203

Publications proliferated on “radical technology” and “autonomous” houses, and these access catalogs provided instructions for ways to live more in sync with oneself, others, and the earth.204 These were intended as purveyors of “information,” not a way to “promote” certain consumer goods, as Lois Britton insisted in an interview.205 These publications took a variety of forms. They could be directories of organizations, personal accounts, or histories of places. They could include detailed architectural instructions or ask for people to respond with their own ideas for how to build dwellings, shelters, and other structures. They ranged from glossy publications that ran for years to single printings.206

Such publications depended on the reader to construct their own view of the knowledge and their own choices for action while simultaneously placing readers in a community. As the


203 This follows Arendt in seeing politics as action. As feminist scholar Sherilyn Macgregor writes, politics is “a performing art -- not about creating a finished product but about the process itself.” MacGregor, Beyond Mothering Earth, 75. As Samuel Hays suggests, these activists “fostered the acquisition of knowledge not through professional specialists but through self-education and personal experience.” Hays, Beauty, Health, and Permanence. 262.


206 Sam Binkley provides one overview of west coast publications. Binkley, Getting Loose.
Maine Catalog put it, “The Catalog exists for one function only. It is a vehicle through which all the people of Maine can speak. Its existence depends upon your voice.” They were intended, according to an historian of the alternative press, to provide a means for readers to “meaningfully engage with a disaster of such epic proportions ... [in doing so such catalogs] invited readers to change their own lives, living spaces, and habits.” Access catalogs depended upon an active reader, a person who acted and so placed themselves in community and solidarity with the suggested resources. These access manuals only came alive if someone used them, acted upon the relationships that they implied.

In these publications, personal pronouns, diary entries interspersed with carpentry tips, and photos implied an intimate view of experts’ lives, making transformative work a community effort dependent upon each person’s experiments. As Helga Olkowski, co-founder of the Integral Urban House in Berkeley, California, wrote, “We have no intention of implying that ours are the only available or suitable approaches to reaching the same goal.” The independence of a reader took place within a community of social activists, as expressed in ubiquitous reader comments and contact sections. “Thanks for the first issue,” wrote one reader to Mother Earth News, “Our copy (passed to us 3rd hand) is in great demand … My husband, daughter and I are leaving soon to check out the south as a place where nature nuts, earth freaks,

207 As a scholar of social movement press has written, the ways these catalogs reflected a specific time, and suggested what people could do at that moment, make these journals intensely boring to read today. Bob Ostertag writes that they were “boring and overwhelming at once” and he fell asleep while reading them. Ostertag, People’s Movements, People’s Press, 188. Philip Townsend, ed. Maine Catalog (Portland, ME: Media House, 1973), 1.

208 Ostertag, People’s Movements, People’s Press, 189.

209 As Sam Binkley notes about the Whole Earth Catalog, “Disorganization and typographic glitches, it was argued, transformed passive readers into active interpreters of cryptic, if sincere, market messages.” Binkley, “The Seers of Menlo Park,” 298.

210 See Country Women for examples of direct diary excerpts and The Journal of the New Alchemists for playful photos documenting life in the organization.

211 The Farallones Institute, The Integral Urban House: Self-Reliant Living in the City (San Francisco: Sierra Club Books, 1979), 3.
and funky folk could make a good life.” “Thank you, thank you, thank you, Sykes,” responded the editors, “and I hope you’ll write MOTHER regular letters while you’re on the trip. Two other children of mine just surveyed western North Carolina ….”

Another wrote: “Hey, we’re a movement? I thought I was the only one. Enclosed find check for one year’s subscription and a copy of TMEN No. 1. Someone just gave me Nos. 2 and 3.”

Large portions devoted to reader letters and extensive contact sections gave publications a feeling of a public forum, directed not by an unseen editor but by the readers themselves. However, no book lacks a narrative and these catalogues and DIY manuals did make arguments about what kinds of relationships could care for the earth.

The self-sufficiency of technoscientific control these activists embraced took place in the home. As historian Samuel Hays contends, “The design of a home around new forms of energy or in new relationships with natural forces ... provided possibilities ... To design an entire homestead called for knowledge about a wide range of biological and geological factors along with machines appropriate to the scale of a home-sized management system. It is no wonder that a considerable amount of alternative technology grew up around the design and organization of housing and the attempt to integrate work, home, and consumption.”

AT’s material instructions primarily involved interventions within living spaces. Domebook, Domebook 2, Shelter, Shelter 2, Dwelling: Making and Living in Your Own Space all captured the need to

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214 See Denis Wood’s argument that even atlases must be seen as narrative arguments. Rainbook, a compilation of articles from RAIN, for instance, made a specific argument in its arrangement of information. The editors began with “Place”, followed by entries on economics, community building, communications, transportation, shelter, agriculture, health, waste recycling, and energy. This was a deliberate choice, making place and economics foundational to all the other types of information. Indeed, they wrote about energy that “It often sounds as though energy is the most important thing on earth. It isn’t.” Denis Wood, “Pleasure in the Idea: The Atlas as a Narrative Form,” Cartographica 24, no. 1 (Spring 1987). De Moll, Rainbook: Resources for Appropriate Technology, 197.
215 Hays, Beauty, Health, and Permanence. 262
construct novel domestic spaces to “car[e] for our earth.”216 and that through such it would be possible to “recreate the opportunities for people to derive meaning and satisfaction from their experience of natural cycles as these occur in the household.”217

In focusing on the home, AT drew on a long cultural tradition in the United States that viewed private property as the realm of personal freedom. As historian Andrew Kirk puts it, this activism fit “perfectly with American traditions of property rights and cultural assumptions about individual control over home.”218 Kirk further argues that “ability to move Ats into the world of the American home was of critical importance in the 1960s.”219 The home, in AT, was the primary site of ecological and social revolution.220 AT advocated both changing practices in homes and imagining homes to be part of ecological processes. They encouraged water, energy, and food conservation, seeing these as crucial to earthly preservation.221 National Centre for Alterative Technology in Wales began a “Demonstration Home and Local Energy Center” whose aim was to “attract visitors from a wide area, and will act as the base for a concerted effort to help households … to take action in their own homes to conserve resources and avoid pollution.”222

In addition to such practices, proponents saw homes as part of ecological systems (Figure 4). As the architect Sean Wellesley-Miller put it, “the home … reflects, on the level of the biological unit, the same needs that society as a whole exists to provide. By changing the house we inevitably change society. …. What cannot be changed from the top may perhaps be changed

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216 River, Dwelling, 2.
217 The Farallones Institute, The Integral Urban House, 35.
218 Kirk, Counterculture Green, 87.
219 Kirk, Counterculture Green, 88.
220 Pursell also discusses the centrality of housing to AT. Pursell, “Sim Van Der Ryn.”
221 For an example of this, see Helga Olkowski and William Olkowski, The City People’s Book of Raising Food (Emmaus, PA: Rodale Press Inc., 1975).
from the bottom. Your home is your biosphere … Taking this approach, we can apply much the same criteria to the home as suggested for society as a whole.”223 Similarly, John Todd suggested that the “modern house” “drains you emotionally, physically, and financially because it really doesn’t do any of the jobs that houses should do.”224 The solution for these architects and biologists lay in transforming homes into place open to, and mimicking, natural processes. It was only through the home that “man can change his lifestyles and buildings to conform to nature and therefore curb his traditional destruction of the natural world. Man’s activities can then merge into ecological systems; his architecture can become complementary, rather than parasitic, toward natural resources, and be powered by the same forces that drive the biosphere.”225


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The image, overall, was of humans living at-one with themselves and nature through correctly mediated practices of home (*Figure 5*). These included using solar energy, composting, growing one’s own food, living untethered from the oppressive technologies that contributed to “the consumptive and apathetic urban lifestyle.” In contrast, a self-sufficient and autonomous home could “could create an informed, active citizenry that can produce healthy changes in our civilization.” Connecting homes to ecological processes provided someone the freedom to be oneself and, simultaneously, care for society and the earth. As Kate Eldred, part of the New Alchemy Institute said, “So there was always a family and domestic component to it. What got all the attention was the integrated aquaculture and the innovative technologies and stuff like that. But our real message was its family. But it wasn’t overt. It was just kind of essential. I think a lot of people came away with something they could use at home.”

However, despite historians recognizing the centrality of home to AT, only the architectural history Felicity Scott has discussed the implications of constructing home as a site of technoscientific citizenship. In her work detailing the political outcomes of architectural “outlaw territories,” she argues that in the move to control the home in international discourse, “The house was to be quite literally a tool for what Foucault called the ‘calculated management of life,’ the place wherein domestic economics and political governance converge, the most intimate site for control over families, and hence, in [Barbara] Ward’s analysis, over life itself.” Making homes spaces of self-sufficiency and governance “validated a precarious form of life and located those unsettled citizens and displaced persons, as well as their abodes, within a governing apparatus that could put them to work for profit.”

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226 Both quotes from Olkowski and Olkowski, *The City People’s Book of Raising Food*, 207.
227 Kate Eldred, interview by Emma Schroeder, May 31, 2017.
228 Scott, *Outlaw Territories*, 241-42.
activism opens it to other types of analysis particularly the centrality of racial and gendered rhetoric in promoting ecological living.

![Diagram of energy flows through shelters. The Farallones Institute imagined the Integral Urban House as connected to ecological systems. The Farallones Institute. The Integral Urban House: Self-Reliant Living in the City. San Francisco: Sierra Club Books, 1979, p. 19.]

**Figure 5.** Diagram of energy flows through shelters. The Farallones Institute imagined the Integral Urban House as connected to ecological systems. The Farallones Institute. *The Integral Urban House: Self-Reliant Living in the City.* San Francisco: Sierra Club Books, 1979, p. 19.

**Gender and AT**

Scholars have yet to include gender in any meaningful way when discussing this movement. While historians show that women make up the majority of those opposed to nuclear power and nuclear war, the movement intended to provide alternatives to such technologies remains stubbornly ungendered.\(^{229}\) Gender is a crucial lens through which to view debates over the intersection of international development, citizen science, and arguments for alternative forms of “self-sufficient” domesticity to curb global ecological collapse. The liberating counter-

conduct of technological control embraced by AT rested on gendered metaphors, as their “soft” and “gentle” technologies were placed in opposition to the “hard,” controlling technologies of industrial modernity. In the process of making domestic technologies and practices crucial to caring for the earth, white, middle class women became stewards for earthly well-being, using tools designed by “outlaw” male appropriate technologists.

Figure 6. Women at work in Appropriate Technology. The catalog *Radical Technology* used women working in traditionally male jobs to indicate the potential for social change “radical technologies” could create. *Radical Technology*, “Vision 5: Community Workshop,” pp.200-201.

Gendered imagery played a crucial role in delineating AT as part of the counterculture, as a form of political revolution, and as a method of technological change (for instance, in images of women undertaking unconventional labor, *Figure 6*). As historian of technology Carroll Pursell suggested over 20 years ago, “one finds often enough that Appropriate Technology was

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represented as more feminine than the hegemonic technology and therefore seen by some as a threat to accepted notions of masculinity.”\textsuperscript{231} What Pursell missed in his astute view of gendered language was the simultaneous celebration of masculinity in the pages of AT magazines. Or as historian Fred Turner contends, the world imagined was “masculine, entrepreneurial, well-educated, and white.”\textsuperscript{232} In these pages, gendered discourse could simultaneously imply revolution and stasis. Descriptions of an assurance of masculine independence accompanied concepts of radical gender revolutions.

![Image of an androgyne](image.png)

Figure 7. An androgyne representing the balance of masculine and feminine principles. The New Alchemists Newsletter, Spring 1972.

\textsuperscript{231} Pursell, “The Rise and Fall,” 630.
\textsuperscript{232} Turner, \textit{From Counterculture to Cybertculture}, 97.
In descriptions of social change, ecological holism rested on overturning traditional gender roles. For instance, the image on the front of the New Alchemists’ first newsletter was a “hermetic androgyne, a symbol of traditional [Chinese] alchemy,” according to Nancy Jack Todd, a co-founder of the New Alchemy Institute (Figure 7). For Jack Todd, they had hit “upon a key to fundamental and essential transformation: a balance of masculine and feminine principles rooted inseparably in the natural world, equal partners in seeking to right the balance of the human relationship to that world. The ultimate alchemy.”233 Unity of masculinity and femininity indicated the unity of humans and nature. The images in access catalogs imply social revolution because men, women, and children fill unexpected roles: men play with children; plants inhabit houses; children run wild; women harvest wheat (Figure 8).


233 Todd, A Safe and Sustainable World, 73.
Participants in AT knew that their work set them outside of established social patterns, as indicated by observers’ claims of sexual transgressions. In an interview, the National Centre of Alternative Technology’s director recalled that “people said it was hippies in the hills, some people said that it was dirty, some people said it was people doing drugs and having communal sex all of the time some newspapers tried to push that image onto us quite clearly.”\textsuperscript{234} Those working at NCAT played on these fears and wrote a satirical pamphlet describing their organization, promising to “help to conserve the world’s resources by loving less wastefully” and claiming that they “believe[ed] orgies are a good way of helping the staff get to know one another.”\textsuperscript{235}

While groups used gender to indicate the radical potential of their technologies, gendered imagery in AT could be, paradoxically, as stultifying as it was transformative. Proponents often wrote ecological homes into being through the imagery of the “family of four,” a concept that reified the transhistorical aspects of the post-war “nuclear” family, often white, as the correct inhabitants of an ecological home (see the man returning home from work in a suit to his ecological home, \textit{Figure 9}). In this vein, such families need to be celebrated rather than overturned, as “the home and family unit may again become a basic cornerstone of a planetary civilization.”\textsuperscript{236} Catalogs discussed conventional labor in homes, with men mowing lawns and caring for infrastructure. One publication indicated the changes a neighborhood could make, writing of “the Joneses” and “Mr. Doe.”\textsuperscript{237} By the late 1970s, even conventional merchandise catalogs promoted energy technologies in ways that affirmed middle class femininity and

\textsuperscript{234}Peter Raine, National Centre for Alternative Technology interviews, NCAT.
\textsuperscript{235}“Alternative Visitor’s Guide,” nd, 7/4, NCAT.
\textsuperscript{236}Olkowski and Olkowski, \textit{The City People’s Book of Raising Food}, 208.
masculinity. “His and Her Urban Windmills” promised men and women that they could “enjoy today’s electrical appliances and gadgets without overtaxing public power supplies, family utility bills, or tempers.” Gendered discourses may have reified, rather than reimagined, social hierarchies of power.

Figure 9 The Integral Urban House. The image of home promoted by the Integral Urban House in Berkeley included a man seemingly returning home from work in a suit. The Farallones Institute. *The Integral Urban House: Self-Reliant Living in the City*. San Francisco: Sierra Club Books, 1979, p. 10.

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Men involved in AT worried that the “emasculaton” of lives could be one cause of the “chaos, violence and disintegration which threatens modern society.” AT itself drew heavily on images of masculine inventiveness, “outlaws” on engineering frontiers, drawing on a do-it-yourself masculinity that has a long history in American culture. Some were “cowboys” on an information frontier. Thus the soft, gentle technologies were still the product of masculine science. In this, AT was not far from other alternative lifestyle experiments, especially back-to-the-land, in which men and women maintained traditional labor and modes of femininity and masculinity. Masculinity was essential to this form of technoscientific citizenship.


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241 Fred Turner writes that “and he is a ‘he’ -- there are no women in sight.” Turner, From Counterculture to Cyberculture, 87.
243 Joanna Dean makes a similar argument about masculinity in environmentalism. Dean, “A Gendered Sense of Nature.” Noël Sturgeon also contends that race and gender define environmentalism in popular culture. Sturgeon, Environmentalism in Popular Culture; “The Power Is Yours, Planeteers!”
The earth thus created by AT was not inclusive, neutered, or raceless, a home for all humans. It was specifically formed out of ideologies of masculine, white inventiveness and middleclass domesticity. The citizenship of AT, that is, may not have allowed people to “act politically and appear as citizens in public” as it did not allow them “to express ‘who’ they are, to realize their human distinctness.”

Conclusions

Metaphorically constructing ecological design through domestic and gendered imagery may have undercut AT’s revolutionary potential despite the best of intentions. They argued for liberatory technoscientific citizenship, in which all people could take control of technological change and therefore assume economic and political power. While this constructed the possibility of new political identities, the use of masculine inventiveness and feminine domesticity to depict such work reified conventional identities of the post-war period.

Timothy Mitchell has argued that a politics based on energy scarcity in the 20th century led to autocratic rule and corporate profits. AT, with its vision of limitless solar energy, intended to overturn this view of scarce energy resources and the political power it engendered. Yet the embrace of self-sufficiency merged with wider cultural debates over poverty and welfare. In the racially coded language of the 1970s, impoverishment was increasingly seen as a matter of individual responsibility. By celebrating individual work and self-sufficiency, AT fed into the conservative, racist movement to reduce state support for citizens, making individuals fully responsible for their ecological impacts.

244 MacGregor, Beyond Mothering Earth, 72.
245 Mitchell, Carbon Democracy.
While AT may have rejected the consumerism of Cold War domesticity, their work affirmed specific kinds of homes as holding the solution to urbanization, industrialization, and ecological deterioration. Calling ecological living into being through depictions of white, middle-class domesticity were not innocent invocations in the 1970s. In that decade, white flight to the suburbs caused cities to increasingly become financially insolvent, leaving the communities of color who remained to face economic, social, and political crises. White women joined the workforce in larger numbers, which caused concern, while politicians framed black women who did not work as “welfare queens,” unfairly dependent on the public funds. Ecological domesticity promised not only a salve for a planet in peril, but a solution to these social concerns as well. AT did not only produce tools but specific social orders.247 And as AT came to be a crucial part of international development regimes, technologies could export specific gender orders and social norms as well.

Women, in particular, suffer from an environmental “politics” that elevates domesticity as a form of care. As feminist science studies scholar Sherilyn MacGregor argues, “the feminization of the private sphere, and of the responsibility for household management in most cultures, mean that making it a site for environmental action poses particular threats for women and for feminist politics.”248 A politics that opens the production of knowledge to diverse views and allows women to act in public, and not in the private realm of the home, is a radical politics. This kind of citizenship was part of the promise of AT. Yet an ecological holism built on white, middle-class, heteronormative domesticity, much as AT also was, removes women from the public sphere and the process of political citizenship.

247 Jasanoff, “Ordering Knowledge.”
AT’s contemporaries pointed to the political failings of holistic ecological analysis. A

*Ramparts* editorial excoriated Earth Day, arguing that an environmentalist

insists that saving the environment ‘transcends the other issues’ and that we should in non-partisan fashion ‘support a man from any political party if he is a true Friend of the Earth … Never mind if he’s a racist. Don’t worry about whether or not he supports American imperialism … the police continue to murder black people in the streets; the American judicial system is disintegrating and, in the eyes of the State, every radical has become a conspirator; the war machine in Washington has made clear its intention to stay in Vietnam indefinitely and to spread its war to Laos. All this – and the Teach-In organizers want to banish everything but environment to the back pages of our minds. They must be blind, or perverse, or both.\(^{249}\)

AT, despite the promise of economically independent, scientifically empowered citizenship for all, took shape through metaphors that implied racial and gendered difference. Claims to technological choice erased the political and economic inequity the global South and citizen scientists such as Barry Commoner believed needed to be addressed directly.\(^{250}\)

The gendered depictions of ecological domesticity helped create AT but they do not reveal women’s experiences in such groups. The next chapter turns to women’s participation in AT. AT organizations provided grounds for women’s changing relationship to citizenship, and women involved in such organizations helped produce ideas of personal autonomy and earthly responsibility. Indeed, women’s intellectual and physical labor, their personal politics, and their social dreams were all critical to the success of the movement.


CHAPTER 4

“THE WOMEN THING WAS TERRIBLY SIGNIFICANT”: WOMEN’S PARTICIPATION IN APPROPRIATE TECHNOLOGY ORGANIZATIONS

“About the women thing. The women thing was terribly significant,” contemplated Kate Eldred of her time at the New Alchemy Institute (NAI). She continued, “the founders were male, … the worker bees were female, but every woman who worked there was strong and feminist and new age, all these clichés now, many had children, but many were pre-child, went on to have families. And work got done … with care.”

Not only at NAI, but in countless other organizations, women played pivotal roles in the labor, the science, and the politics of AT groups. These women participated as environmentally aware activists responding to various movements for change and as women who held a growing awareness of gender discrimination. The technoscientific citizenship embraced by AT groups offered them the opportunity to expand their place in public life, an opportunity that was nevertheless still restricted by gendered assumptions.

Historians promote the masculinity cultivated by AT advocates by omitting women from their narratives. For example, Andrew Kirk, in his history of the Whole Earth Catalog, mentions the importance of women’s labor, particularly that of Stewart Brand’s wife at the time,

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251 Eldred, interview.

252 There are only a few exceptions to this. In her narrative on the emergence of artisan cheesemaking in the 1970s counterculture, Heather Paxson suggests that this movement, much like AT, saw self-sufficient technologies as bringing personal liberation. She suggests that “the way these women capitalized on their ostensibly domestic labor and pursued the craft of food making ‘reasserted female competence and control’ in a modern economy dominated by men.” Heather Paxson, “When Chèvre Was Weird: Hippie Taste, Technoscience, and the Revival of American Artisanal Food Making,” in Groovy Science: Knowledge, Innovation, and American Counterculture, ed. David Kaiser and W. Patrick McCray (Chicago: University of Chicago Press, 2016). 373. I suggest that women found both economic possibility and foreclosure in AT. This follows the other scholar who has grappled with the gender of AT publication, Mainmise, in Québec. Marie-Andrée Bergeron, “Les Libertés Possibles: La Reconnaissance Du Féminisme Dans Mainmise,” in La Contre-Culture Au Québec, ed. Frédéric Rondeau and Karim Larose (Montréal: Presses de l’Université de Montréal, 2016).
Lois Brand (née Jennings, now Britton). Kirk writes, “Lois’s contributions in the early years of the publication were clearly invaluable, and it is hard to imagine the catalog living beyond its infancy had she not taken control of the business end of things … Women like Lois played a critical role over the years, a fact Brand readily acknowledged: ‘In my experience every working organization has one overworked underpaid woman in the middle of things carrying most of the load.’” Kirk then fails to discuss women at all. Some historians leave female founders out of organizational histories. Historians intimate that AT was men’s preserve by failing to categorize women’s AT groups as part of the movement for technological choice. For instance, the lesbian land separatist movement claimed power through building, farming, and other activities usually dominated by men. They formed collective identities through the pages of magazines such as Country Women. Publications including The New Woman’s Survival Catalog, Creative Woman, and many others celebrated female technological acumen and independence, mirroring AT claims. These, though, have only been considered as part of a feminist, rather than technological, movement.

A similar lacuna exists in the literature on feminist movements in the 1960s and 1970s. Scholars largely look for stirrings of women’s liberation in publications that were expressly feminist or in places that proclaimed their feminist intentions. Additionally, the history of

253 Kirk, Counterculture Green, 50.
women’s liberation usually centers on the antagonism women faced in New Left and other social movements at the time.\footnote{257 Ruth Rosen, \textit{The World Split Open: How the Modern Women’s Movement Changed America} (New York: Penguin, 2001); Evans, “Sons, Daughters, and Patriarchy.”} In contrast to both of these scholarly veins, women often found AT movements to support their arguments for economic equality and consensus-based decision-making practices, even if these feminist practices were accompanied by continued gender inequities.

This chapter looks at women’s lives before their participation in AT, their work within such organizations, and their feminist organizing. I argue that these white, middle-class women held differing opinions on work, childcare, feminism, and the politics of personal liberation. In doing so, I question environmental historian Adam Rome’s depiction of women’s environmentalism as emerging from their domesticity. He writes, “For some college-educated housewives, environmental activism resolved a tension between traditional expectations and unfulfilled ambitions. Because they acted to protect the home and the family, they could enter the public sphere – they could be more than ‘just’ housewives – without rejecting the claims of domesticity.”\footnote{258 Rome, \textit{The Genius of Earth Day}, 37. Also see Rome, “Give Earth a Chance.”}

Rome’s formulation of domesticity separates these women from the changing social, cultural, political world they lived within. Rather than a transhistorical domesticity, these women reflect specific historical circumstances of the 1960s and 1970s. Many were part of what economic historian Claudia Goldin calls the “quiet revolution,” when women had fewer children, divorced more often, were more educated, and (slowly) began to earn more money.\footnote{259 Claudia Goldin, “The Quiet Revolution That Transformed Women’s Employment, Education, and Family,” \textit{The American Economic Review} 96, no. 2 (2006).} Rather than seeing them as pre-political housewives, as Rome’s interpretation tends to, this chapter
asserts that they were part of a “a process of consciousness-raising that involve[d] the self-reflexive creation of new political subjectivities and new knowledges that disrupt gender constructs and gender relations.”

Reading for women’s relationship to science, politics, and labor provides at times paradoxical accounts: women embraced new forms of independent subjectivity beyond domestic motherhood while at the same time celebrating women’s gentle, caring essence. They straddled the line between older forms of femininity based on domesticity and motherhood, and newer forms of women’s independence manifested in their economic relationships and their role in scientific knowledge production. Like the men who were drawn to the AT movement, they were a diverse group responding to their particular moment in history, a moment that for them contained an increasing awareness of gender inequality and a destabilization of gender relationships that Goldin calls a “revolution.”

“We So Thought, All of Us, That We Would Change the World”: Women’s Lives Before AT

Women’s relationship to the kinds of activism encompassed by AT began before they could be considered mothers, housewives, communards, or hippies. Like their male counterparts, they were shaped by childhood experiences and rejected traditional forms of success despite being buoyed by post-war affluence and educational opportunities. Like men as well, they sought a changed world. As Nancy Willis told me, “I just think of it as this incredible kind of journey that like it hasn’t ended really, you know. Kind of makes me cry [crying]. Oh. I wish you could have had one … Yeah. You know what it shows, oh yeah, I know what I was thinking of telling

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260 MacGregor, Beyond Mothering Earth, 66.
you we so thought, all of us, that we would change the world. That we would redirect things in a more positive permanent fashion.”

Their deep political and social commitments place the beginnings of their work beyond the popularized youth movements and environmental turn.

In interviews, women recalled that nature was foundational to their childhoods. However, their nature was not a masculine preserve or removed from human impact. “One interesting fact that I think had a big influence on me but probably didn’t realize it at the time,” Susan Ervin of NAI told me, “but my favorite place when I was a child was my great grandmother and my great aunt ran a small farm … [I] spent my first three years on their farm, and when I was growing up it was always my favorite place to visit, you know go to the barn with my Aunt Edna and to cook on the woodstove with my great-grandmother, so they were strong influences and I just really liked that small farm life.”

For Christina Rawley, also of the New Alchemy Institute, “on the farm you were so aware that life was so much bigger and richer, you saw the cows being birthed … we grew up with that. In the summertime we would take our pillows and … a blanket out into the forest and just find a place to stay and just sleep there.” For Rawley, though, the farm also carried with it her father’s traumatic experiences of war and the threat of pesticide poisoning: “my father was out there, I remember so clearly, and I didn’t understand it except that he was acting so crazy, you know, he would go out there when they came to spray over the whole population, all that Rachel Carson was first talking about … he would go out there and hold up his hands to this, Stop stop, get out of here, don’t spray, going crazy.”

World War II similarly shaped the perceptions of Hilde Maingay, who grew up in Indonesia where she “spent several years during World War II in Japanese concentration camps.” This experience shaped her design

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262 Nancy Willis, interview by Emma Schroeder, 2017. December 12
263 Ervin, interview.
264 Christina Rawley, interview by Emma Schroeder, August 11, 2017.
practices and taught her “resourcefulness, practicality and awareness of the waste in modern society.”

Close to two decades younger than Rawley and Ervin, Gretchen Lemke-Santangelo, of the San Diego Center for Appropriate Technology, recalled being moved by the burgeoning environmental movement in the late 1960s:

I grew up in Northern California, during the era when … environmentalism was … taking on issues beyond the preservation agenda, air pollution, water quality issues, solid waste problems, toxic waste, and the use of pesticides, so I remember reading in high school Rachel Carson’s *Silent Spring* and being affected by the Santa Barbara oil spill [1969] and loving my science classes … my sister and I had both joined the Sierra Club … [we] signed up for backpack trips and did a lot of wilderness hiking and backpacking. So, I had an environmental consciousness, awareness beginning in middle school and then it grew during high school.

For these women, fears of nuclear fallout accompanied fears of pesticide drift and oil spills. Nancy Jack Todd, co-founder of NAI, remembered becoming politically motivated by large antinuclear protests in the U.K. She “became haunted by the horror of war and violence” growing up in the shadows of WWII, politically attuned to “ban-the-bomb and antinuclear movements in England” while a child in Canada. For Todd, who joined the Ann Arbor Women for Peace in the 1960s, the home became “a refuge, with the kitchen at the heart, cheerful and warm. Women, I understood, stayed and tended this heart and men went off to offices.” She vividly remembered radios broadcasting the “guns of World War II.” “War,” she continued, meant “destruction, fear, loss, death … and in my mind, then, and perhaps still, war joined dreary offices in my comprehension of the world of men. So, it took me an awfully long

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265 See John Todd to James Hyde, July 12, 1971 and Hilde Maingay’s personal narrative in Box 706, Folder 4223, RBF, FA 005 RG3 Series 1, RAC.
266 Lemke-Santangelo, interview.
time to realize that I was barred from this world because, in the main, I didn’t want any part of it.”

Other women realized early that they wanted no part of women’s lives that led to “so many hours spent in front of the television, shopping, having hair done, in short on an enormous variety of empty activities and meaningless busyness.” “Socially… I grew up in a very tight, Republican household,” one recalled. Another noted that “I grew up in a middle-class town, middle class family, very conservative time conservative parents.” Still another wrote that “I was born … to a working-class Catholic family. I was always a big, big reader, and so my horizons were far greater than my immediate situation. My neighborhood was not one where people went to college.”

The women who found their ways to the AT movement often rejected the confines of post-war social expectations. As part of “a big family post-war, six children and I was the oldest,” Rawley said, “as soon as I could I left the farm … because I needed to experiment, I needed to see what the world was like outside of the farm.” Many embraced a peripatetic lifestyle and sense of economic freedom. Kate Eldred, who met her husband in Puerto Rico, recalled people who “you know traveled a lot and lived on air. It was possible to do that then.” “Those were the last days of my hippie drifter life,” she added. Willis spent two years in Europe before college; Nancy Jack Todd was born in South Africa, grew up in Canada, then

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270 Rawley, interview.
271 Ervin, interview.
272 Kate Eldred, personal communication with author, October 31, 2019.
273 Rawley, interview.
274 Eldred, interview.
275 Eldred, personal communication with author, October 31, 2019.
moved to the US with her husband, John Todd. Others, like Judy Goldhaft and Helga Olkowski, moved from the east to west coast, participating in radical theater and art collectives while raising children on their own.

Many of these women attended college, gaining financial and social independence, and encountering worlds beyond those to which they were accustomed. For some, college represented a familial expectation. Denise Backus, for instance, had followed the pacifist poet Randall Jarrell to University of North Carolina. She recalled that in her family (her father was at one point an editor of TIME, her mother the editor of *Downeast Magazine*), “the tradition was you went to college and then you went to New York and got a job in publishing and then you could get married. But you needed to work a bit because you never knew. My parents were divorced. I hadn’t thought it could be death. But you couldn’t just be a woman that went from school to marriage. You had to have a break.” Backus reflected a growing sense that women needed to be financially secure on their own, a crucial part of emergent feminism.

College also gave women a growing sense of gender inequities. Susan Ervin became part of the first class of women accepted to University of North Carolina Chapel Hill. College, for Ervin, became a place of self-awareness and women’s inequality in public sphere.

I remember, I mean we had an 11 o’clock curfew but the boys had no curfew. And the average girl had a 4.0 average because there were so few of us. And the guys flunked out right and left, boys came from my high school who were idiots. But they had no restrictions, but we did so we became aware of things like that. And it was just a growing consciousness in myself. I mean this just popped into my mind, I was going out with an older guy, he was actually a graduate assistant.


you probably couldn’t even do that now, he was my teacher, … he was a northern Jewish man, and I remember him saying to me, don’t dumb yourself down, southern women dumb themselves down, you don’t need to do that. And it really struck me, [how] we were taught to be.279

Others also experienced women’s unequal access to opportunities in college. Lois Britton, a trained mathematician who help run the early Whole Earth Catalog, remembered that “There were three women in the engineering department, and I knew them. Why? Because we all took math together, I was as smart as any one of the guys in that, but it was a case of you’re not going to do this.” While she stayed in math, she turned to teaching in her senior year to get a job out of college. She worked as a mathematical aid for the Center for Naval Analysis. While there she became involved in the National Congress of American Indians in the D.C. office. Of this activism, she said, jokingly, that “[I] sat around in the room with the guys and drank,” continuing by saying “actually there w[ere] a fair number of women also involved and that is more tribalistic kind of thing, where a lot of the tribes are matriarchal, they are not patriarchal.” By the late 1960s, she had headed west to teach on a reservation (she is Ottawa).280

While college opened employment opportunities, these women arrived in such spaces influenced by the Vietnam war, civil rights, and other social, cultural, and political upswelling of the late 1960s. It was a “righteous, mind-bending time”281 in which Vietnam, feminism, environmentalism became bound together into general concern for society. As Hilde Maingay remembered, she “followed the whole evolution of thought, of what’s happening in this world, pollution finally became a recognized problem and what it might do for immediately the fish but [also] other things.”282 As with many AT activists, these women were strongly influenced by

279 Ervin, interview.
280 Britton, interview.
281 Willis, interview.
282 Hilde Maingay, interview by Emma Schroeder, August 11, 2017
New Left politics of participatory democracy and equality. Women reflected on their experience as politically motivated humans. The women in AT held intense political views, as Gretchen Lemke-Santangelo recalled: “so in conjunction with our work at the Center for Appropriate Technology we were out there demonstrating and getting arrested … we were all committed feminists, we were all committed to, to racial justice, we were all socialists, and involved in the antinuclear movement. We all came out of activist pasts.”

Or as another put it, “yes the world needs to change, and it needs to be changed for, away from this massive … buy and sell of everything … the way to leave that is by living lightly, … stop using these pesticides and fertilizers which are so damaging.”

It is impossible to do justice to the variety of political views these women held. Women were motivated for spiritual reasons, from radical methodism to Taoism; by anti-militarism and antinuclear concerns; and by the desire to forge holistic lifestyles. For Maingay, holistic work mattered as it mirrored a holistic mindset: “So that was also really important part of New Alchemy because you learn how things are connected … and [in] our modern world we have lost most of the connections. It’s the cycle principle that is completely lost.”

Or according to Anna Gyorgy, “that was a period where we wanted to work together and unite peace and justice with environmental, this kind of everything is connected. And we all brought different skills to it.”

Others had participated in 1960s cooperatives and when those experiments ended, asked themselves, “How do we affect change now? This dream of building a series of collectives that would spread and create a grand social-cultural revolution never materialized.”

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283 Lemke-Santangelo, interview.
284 Rawley, interview.
285 Liz Todd at NCAT also referred to spiritual social justice activism through radical Methodism. Liz Todd, interview by CAT Oral History Project, October 27, 2012.
286 Anna Gyorgy, interview by Emma Schroeder, October 25, 2017.
287 Lemke-Santangelo, interview.
While they joined men in political protests and reimagining public life, social and cultural norms related to marriage and divorce influenced the women who participated in the AT movement.\textsuperscript{288} Susan Ervin had divorced her husband and moved to Boston in search of intellectual and political engagement when she found NAI. Many women were single mothers trying to make ends meet, and they entered AT organizations as part of finding economic stability.\textsuperscript{289} Denise Backus had found a job in the late 1960s after her husband left her and their two children: “My husband really was too young to be a beatnik and too old to be a hippie or the other way around, one or the other, but one of those, and he disappeared at some point.”\textsuperscript{290} Hilde Maingay “was primarily housebound with little kids.”\textsuperscript{291} By the time she joined NAI, she was divorced and working any job she could get to support her three children. AT offered an alternative form of employment to ease the economic burden of raising children on one’s own.

In their reaction to post-war technological violence, their embrace of college education and employment, their political consciousness, and their experiences in the social and cultural revolutions of the 1960s, these women do not fit environmental historian Adam Rome’s depiction of “housewives” taking up environmental causes. They were far more independent, self-supporting, and politically self-aware than the usual interpretation of the term allows. As Stewart Brand described Lois Britton in a 1965 diary entry, “the least hung-up girl I have loved. She is like Jaime de Angulo’s prose – clear, apparently effortless, … of profound and beautiful moment.”\textsuperscript{292} The independence, self-determination, and political views of women like Britton

\textsuperscript{288} As Ruth Rosen noted, divorce rates rose dramatically during the 1960s. Rosen, \textit{The World Split Open}, 315.
\textsuperscript{289} Judith Varley, interview by CAT Oral History Project, August 31, 2012; Willis, interview by Schroeder, 2017; Christina Rawley, interview by Emma Schroeder, 2017; Hilde Maingay, interview by Emma Schroeder, 2017. Goldhaft, Olkowski
\textsuperscript{290} Backus, interview.
\textsuperscript{291} Maingay, interview.
\textsuperscript{292} Stewart Brand diary, March 3, 1965, p. 32, box 17, folder 10, Stewart Brand Papers (M1237), Stanford University Special Collections, Stanford, CA (hereafter SBP). In this same entry, Brand notes Lois’ maiden name as “Jennings” and that she was 23 at the time (therefore born in 1942).
should not be simplified, and they joined AT organizations for a variety of reasons. Once they had joined AT groups, they found that concepts of community scientific practice and individual self-determination supported women’s changing professional status, their social standing as independent wage earners, and their relationship to the political sphere.

“A Chance to Develop Ourselves”: Political and Economic Equality in AT organizations

By the time women joined AT organizations, as volunteers, founders, or employees, they held specific experiences that had shaped their political desires and economic possibilities. AT organizations, though, provided “a chance to develop ourselves,” as Hilde Maingay put it, by giving women employment opportunities beyond those usually open to women; by engaging in non-hierarchical decision making; and by providing equal wages to all employees regardless of education or sex. Women came to organizations as single mothers, needing not only an idealistic adventure but a way to make money to support themselves and their children. AT organizations, with their commitment to collective knowledge production and communal support, often had nonhierarchical wages, with everyone paid the same amount regardless of job, education, or sex. At a time when women’s employment opportunities and wages were limited, AT provided a potential form of economic equality to those women who joined.

Consensus decision making played a critical role in women’s participation in these organizations. Ervin remembered that “There was not a top-down attitude in those things, so you created your own area, built your own area and you weren’t directly accountable to anybody, you were accountable to the group.” Many commented on the importance of consensus-based decision making in the groups they were in. As Ervin continued, it “was a very powerful experience to actually be able to live that way.”

293 Ervin, interview.
consensus, we really modeled kind of a hyper-democratic ideal, so we made all of our decisions by consensus, we lived on ten dollars a week and very simply.” But consensus did not work for all. As one noted, “I hadn’t found my voice … Where I did feel equal was in terms of the appropriate technology, bioregionalist vision stuff because we were all learning that together and I was doing the research right along with them.”

In most AT organizations, everyone was paid the same amount, despite academic degree or type of work. This held a promise of radical economic change for women more than for men. As one woman remembered about her mother’s work experiences,

One of the things that really, really disturbed her was that when … she and my father went and … got jobs, and even at the same level, she was never paid as much. And … the retirement pay was much lower for her than for my father, and then after working for all that time, … when dad died, she was left with only her income. Whereas women who had never worked, and never paid anything in, got a significant amount of money from their husbands.

Equality of wages meant that everyone lived frugally (as Lemke-Santangelo recalled of living on 10 dollars a week), that educational experience or sex did not determine income, and that people were not competing over hidden wages. For instance, when Denise Backus arrived at New Alchemy, they had just voted themselves a wage increase. Two weeks later, they took it away, deciding that they could not, in fact, afford $9000 for each employee. The beauty, though, lay in the fact that everybody made the same amount, men and women, regardless of degree, and that they had control over their pay. Backus recalled that “the idea that there is no secret about what anybody made was wonderful. What a concept … this was great. And it was decided together.”

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294 Lemke-Santangelo, interview.
295 Rawley, interview. In fact, the wage gap did not begin to shrink until after the 1970s.
296 Backus interview. John Todd mentions this as well in his article in Co-Evolution Quarterly. Todd, “The New Alchemists.”
AT’s practice of science as relational knowledge production provided the grounds to deconstruct the figure of a rational, male objective scientist. Many feminist historians of science have shown that scientific rationality co-produces the independent liberal citizen-subject.\textsuperscript{297} Men, not women, have been constructed as rational, independent witnesses to the political and scientific world. In AT, science was re-constructed to include relational, responsible subjects.\textsuperscript{298} Including all people in epistemological creation provided grounds for enlarging just who got to be a knowing, witnessing citizen. And women in AT took the possibility of becoming scientific citizens as a crucial part of their social activism.

In these organizations, the citizen became constructed as a relational, responsible actor and thinker, someone who through individual choice could make the world anew. This vision holds within it transformative potential, as Nancy Jack Todd indicated in an article for \textit{Habitat}. “For women and other segments of society who are resentful of the control exercised over their lives by the dictates of our present economic and political systems,” Todd wrote, “the bioshelter has a potential for self-sufficiency that could relieve their exploitation.”\textsuperscript{299} Women embraced the promise of self-determination and the power to create spaces long left in the hands of male architects and scientists.

Data collection filled all parts of daily life, as did technological innovation and experimentation.\textsuperscript{300} By moving the production of scientific knowledge into spaces equally occupied by men and women, women could take on roles previously denied them by educational status or domestic work. Designs, data, and experiments filled AT publications, all presented in a

\begin{thebibliography}{9}
\bibitem{297} Donna Haraway, \textit{Modest_Witness}; Michelle Murphy, \textit{Seizing the Means of Reproduction}.
\bibitem{298} This occurred in other 1970s grassroots scientific movements as well. See Murphy, \textit{Seizing the Means of Reproduction}, esp. chapter 2.
\bibitem{300} See examples in the \textit{Journal of the New Alchemists}.
\end{thebibliography}
way that assured readers that they, too, could take on this kind of technological innovation. Hilde Maingay recalled that for her master’s degree, she “had to write up everything I did here for two years in the garden. So, all the graphics, the statistics, the drawings, everything. And that was used for New Alchemy anyway.”

That they conducted their science in homes, in spaces dominated by women, further opened technoscientific citizenship to women. As Rawley noted, “And always, sort of the gender balance was considered in the whole of [the project] because … [it was] one that [was] actually in many ways home-based, so … who knows more about the home and getting to the base of things than women?”

Additionally, women wrote and edited many AT publications, giving them power to shape how an organization appeared to the public. Gretchen Lemke-Santangelo, for instance, did most of the editing, bookkeeping, and researching for the San Diego Center for Appropriate Technology’s newsletters. She recalled, “I did all of the writing, we all did the research and then I compiled it and did the writing. It just turned out that … it came easier to me than other people … we applied for nonprofit status and I remember doing all the paperwork for that and then … I did all of our educational materials and then did the bookkeeping for us too, but I also did, I did construction and ran the tours, I mean we were all doing that stuff.”

The nonhierarchical decision-making, the collective research, and the shared responsibility for labor opened the possibility of overturning conventional work relationships. As Judy Goldhaft of Planet Drum recalled, “the way that the Diggers worked, and also the way that Planet Drum has worked is, if you want to do something, if you want to do a project, you can do it. And people will support you and help you do it. And that’s the way the Diggers worked.”

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301 Maingay, interview.
302 Rawley, interview.
303 Lemke-Santangelo, interview.
304 Goldhaft, interview.
Maingay, for instance, was divorced and raising three children and had tired of working as a cleaner or typist. Maingay told me that while she joined NAI as an administrative assistant, this changed with the arrival of Earle Barnhart, her current husband. She said, “at one point I said to him I hope this will change I hate typing because for my whole life I had to make money for the kids typing. And he said Oh I don’t mind typing and he took over all the typing. So there was somebody who did not have these preconceived ideas of I’m going to progress to the top and you stay in the office doing the work.” Maingay went on to be one of the head horticulturalists at NAI, running experiments on soil fertility and integrated pest management among other things (Figure 11).

Women understood the power choosing a scientific professional life would give them. As H. Patricia Hynes stated, she entered a “master’s program here at University of Massachusetts School of Engineering in Environmental Engineering. And I … think feminism really shaped my choice. I felt that it would be the most rigorous … of the places where I could study the environment … I know that feminism was definitely an influence in the confidence and also in the desire to get a degree that would give me influence in the world.”

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305 H. Patricia Hynes, interview by Emma Schroeder, October 31, 2017.
Despite the promise of equality, women and men undertook different work within these organizations. Women often took on the more “feminine” tasks of gardening and cooking (which for some, like Maingay, was far better than office work), while men innovated with windmills and solar panels. As Backus related, “the women were more involved in producing food, making food, cooking food. And the men were more involved in windmills, greenhouses, building greenhouses but not running them, so it really was the builders and the producers.” In “Undercurrents of Chauvinism??,” an article in the AT journal Undercurrents, Lyn Gambles railed against the gendered division of labor in AT. She argued that women needed to claim knowledge of how to “mend a fuse or a leaky tap. If all the women in the alternative science and technology movement end up weaving all the rugs, and all the men end up building all the

306 Backus, interview.
windmills, then no-one will be liberated. Seize the time sisters, men are learning new and simple techniques, techniques ordinary people use for their basic needs. Now is the time to learn, when everybody is learning.”

“Now is the time to learn, when everybody else is learning.” The call to knowledge production, self-awareness, seizing the means of producing food, energy, and shelter: these were the promises of AT for women. By opening technological and scientific innovation to places and people beyond laboratories and experts, the edifice of scientific power crumbled to make room for other subjectivities and ways of knowing. Women found personal empowerment in consensus decisions, in developing research projects, and in an equal wage, types of power not allowed them in dominant forms of citizenship and politics.

However, many women were not free from conventional gendered constraints of domestic care and maternal responsibilities. As Gambles wrote in another article, “Everyone in the AT movement pays lip-service to feminism, some even embrace it warmly. Liberated women are Attractive.” In response, she turned to feminism, which “triggers the flight of women from communes up and down the country. Women need to stand on two feet in the world of action, it is too early to return so soon to the world of householding on smallholdings.” Some of those who had returned to the “world of householding on smallholdings” found the situation untenable.

“Strong Mothers” and “Women Isolated at Home with the Children”: Women’s Domestic Labor in AT

In AT, women found themselves paradoxically freed to take on novel forms of economic independence and professionalization, while also relegated to the traditional care-work tasks of women, including food and childcare. For some, this provided a potential form of empowerment,

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a “power through.” Others, though, objected to, and organized against, domestic labor and maternal care. In containing a story of women’s increasing economic independence and professionalization, as well as their continued work of maternal and domestic care, the history of women’s labor in AT epitomizes the historical trend of women increasingly gaining employment in the 1970s while maintaining their domestic work – the “double burden” that so many women face. As feminist science studies scholar Sherilyn Macgregor writes, such care work enabled deregulation and removal of state support, so that it was “progressively intensified by a right-wing privatization agenda that [sought] to cut spending by downloading the work of caring to civil society and individual families.” Such state removal relied “on the cheap, even free, labour of women.”

Despite Jack Todd’s assurance that there were no “a priori” sex roles when working in ecological design, women came to realize that gendered divisions of labor had not changed when faced with kitchen duties. Nancy Todd described their realization in an article titled “Preservation of Food; Preservation of Self”:

The food-processing, and predictably the housekeeping, are the areas where the difficulties of sex roles are most readily apparent, and equally predictably, it is the women who are least pleased with their lot … The solution … I think must be to work with men whose consciousness has been sufficiently raised to understand how thoroughly sexist has been all of our backgrounds. … I do see a transition, perhaps on the slow side for our taste, coming about in which the jobs, particularly those that we as women find most psychically oppressive, are being shared on an equal basis … yet I still have a memory of a hot afternoon, a sticky kitchen, stacks of vegetables threatening to molder and an all-female and very resentful crew.

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309 MacGregor, Beyond Mothering Earth, 68.
Once vegetables came into the kitchen, the ecological processes praised for facilitating social change became vehicles for continued inequalities. Women unwillingly undertook the labor necessary to deal with the demands made by rotting vegetables.

Many women found themselves undertaking traditional domestic duties. Lois Britton remembered that “men worked in construction projects while ‘women put the Clorox in the water to keep everyone from getting sick.’” She recalled that

I do know that the final straw, according to Stewart, the final straw in our marriage was when I asked him to wash the dishes. [laughter] That sounds funny doesn’t it? I was getting up in the morning, fixing breakfast, going out, driving to the truck store which was a thirty-minute drive, working eight and a half, nine hours, driving home, fixing dinner, but when I got home, I had to wash the breakfast dishes because he wouldn’t wash the breakfast dishes. And he thought that that was, his implication when he said, was that I was demanding time from him when he had more important things to do.

Figure 12. The New Alchemy kitchen. *Journal of the New Alchemists* 3 (1976), p. 11.

312 Quoted in Turner, *From Counterculture to Cyberculture*, 76.
Maternal care, alongside other domestic duties, marked the largest divide between men and women. For some women, children stood as the reason for their work. Jack Todd, for instance, recalls being pushed into environmental awareness through concern for children around the world. As she watched the air pollution in California, her “anxiety was compounded by a sinking fear for the future of our children … I knew that for my own children to have a future, it had to be secured for all children. Looking back, I realize that was the beginning of my slowly dawning awareness of humanity’s utter dependence on the biological life-support systems of the natural world.” Other women discussed the centrality of children to their activism; Nancy Willis remembered of her work on PEI that “it was a wonderful place to raise children [which was] really, really important … our kids ran free, everybody nurtured everybody else’s children.” Rawley suggested that “the rule was you know we should never be creating anything that would harm the children … so it was all, … organic food, … developing forms of energy reduction that would be no harm, and so on, … it was a very, … home-based attitude, we wanted to protect people.”

Women, while arguing for novel structures through maternal care, also poignantly questioned the experience of being a mother in these organizations. For one, “I think that if I look back you asked me to do the same thing now, I wouldn’t do it because I think it very much left a lot of us looking after children and … our philosophy at the time was we hoped there would be more equality … you looked after children all day, every day, on your own with no respite. And I think that’s [an] important point to record.” Liz Todd, who stated that she and her husband “were driven by an enormous sense of purpose … believed we were doing

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313 Todd, A Safe and Sustainable World, 7.
314 Willis, interview; Rawley, interview.
315 Liz Todd, CAT oral history project.
something that really really mattered…”, described her maternal labor: “I was pregnant and had a very small child, so my involvement in it at that stage was very difficult, I lived in a campervan on the site, my contribution was making endless dumplings for people who were volunteering.”

After discussing the ways she felt the place wasn’t suitable for children – safety, too much public attention despite the children loving the community – and their move to a house, she continued “No I didn’t like it at all. Robert would go off to work and I would be left with the same problems … it was cold, we didn’t have a telephone, I didn’t drive, it was quite isolating.”

Eleven years after Todd’s experience, Sally felt similarly:

> What is different here from the outside world? – A homeless couple with a two month old baby; women isolated at home with the children, dependent on cars and telephones for their sanity; dedicated souls cycle to work – fine if you’re young and fit and don’t have a couple of kids in tow – but count the journeys up and down the hill, into town ‘because there isn’t time’ … it does seem that individuals are expendable, eternally replaceable … renewable … If you do ever ask yourself why Quarry women leave, or detach themselves or give the ‘Quarry or me’ ultimatum, my reply is that you don’t want them (or their children), their involvement in what you are doing … enough, … enough to …

Women like Sally began to speak out directly against the patriarchal structures and masculine power within AT organizations.

“Articulate Our Frustration”: Emerging Feminisms

In 1973, Lyn Gambles wrote a short piece in Undercurrents, an AT journal. In “Undercurrent of Chauvinism??” she proclaimed that, “So far the alternative science and technology movement has ignored the women’s liberation movement almost totally,” continuing on to argue that

the technology and politics explicit in the Women’s Movement should be at the core of any movement for alternative science and technology, because they are at the core of self-determination and self-reliance … Among all the talk of post-

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316 Liz Todd, CAT oral history project.
317 Sally to “The WHOLE Quarry Community”, June 12, 1985, Box 4, item 9, NCAT.
Gambles, along with other women in AT, found themselves at odds with the proclaimed “humanist” technology that reinforced gender roles and did not grapple with women’s issues, including contraception, abortion, childcare, or economic equality. In many groups, women decided to form feminist coalitions on in order to “articulate [their] frustration.”

Women advocated for themselves as equal partners in the work of AT institutions. As Rawley contended, they believed that “we can, we have to fight this, we have to show, we have to get through this, we’ve got to be considered of equal value,” not only in AT organizations but in larger society as well. For Maingay, the labor of farming merged seamlessly with personal respect and feminist ideals. As Jack Todd wrote, “‘Smell’, said Hilde, who is our chief gardener and thinks well of compost. ‘That’s the new perfume.’ To which one of the men, who has a voice which has been described accurately as stentorian tones, ‘If this is the new perfume, then women’s liberation has gone far enough.’ And Hilde said, ‘It’s just beginning.’” Maingay remembered this exchange with a small smile. “You always come across stuff, men who unconsciously, hopefully, most of the time, put women down … And it is part of the culture, it’s what you do. If you feel threatened at all of not being above somebody that you make sure to tell them they shouldn’t rise up to the occasion and it happened with a lot of people that came in here. And no, it wasn’t discussed, it just came out, whatever he said was just so offensive.” For her, the message turned not to feminism but humanism. Or as she said, “But it was definitely a more equal society and work environment than at that time you would find almost anywhere. So that was very important.” Maingay recounted in an interview, “most people got a lot of really

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318 Gambles, “Undercurrent of Chauvinism??,” 5.
good experiences that way, growing up, being independent and equal and accepting that from both sides.”

At NAI, women brought their dissatisfaction to the attention of the men and the Institute instated weekly chore rotations. Nancy Jack Todd reported that,

It is less the dreariness of the work in question than the acceptance, often unconscious, on the part of the males that, whatever mess ensues in the wake of his activities, it will sooner or later be dealt with by someone other than himself. And the odds are pretty high that that someone will be female. … this is not much of a problem for us any more. What began to turn the tide was our (the women) realizing the necessity for articulating our frustration.

The story of housework represents just one instance of women’s political organizing. Jack Todd recounted, “Women’s caucuses and workshops became an integrated segment of our overall reality … although not always with overwhelming enthusiasm on the part of everyone. [Bill] McLarney once was spotted crawling behind some conveniently located bushes to avoid encountering an empowerment workshop composed entirely of women.” Women also began organizing around issues of feminism, ecology, and nuclear power. Indeed, Jack Todd spent time lecturing on “women and ecology” at Murray Bookchin’s Institute for Social Ecology and gave several presentations to UN gatherings on women and technology.

Women adamantly advocated for women’s rights as integral to their work protecting “the rights of all people and life on this planet,” remembering that “it was so wonderful to be with other women who were thinking in the same way, we all … came from different places and different lives … but to share … the problems of growing up in a … man’s world. And so as we were developing the alternative, we were working on these issues. … it had to include equally women.” Even those who spent limited time with AT organizations reflected on women’s

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320 Maingay, interview.
322 Todd, A Safe and Sustainable World, 75.
323 Rawley, interview.
strength in such organizations. “I became aware of choices and decisions I could make, priorities I might have to choose, and roles I might or might not fill. This was exemplified by the women at New Alchemy,” wrote one apprentice, Nancy Wright. She went on, writing that “I saw and was friends with women who were very consciously dealing with their changing roles in society and in their own lives. There was a spirit that I had never felt before, a pride in being who and what they were as vital, contributing individuals and as women. It was, in my mind, not only a manifestation of women’s liberation, but people’s liberation.”

These women’s politics cannot be seen as emerging only from their feelings of disaffection in a male-dominated AT movement (as is the traditional narrative of women’s liberation movement in separating from the New Left and Civil Rights movements). Rather, paying attention to the diversity of their political views, the range of influences, and the diffuse forms of women’s power they sought ensure that they stand as political beings in their own right, not only narrated as reacting to masculine biases within organizations. And seeing women as technoscientific citizens provides ways of acknowledging that women themselves were not in agreement about what women’s relationship to technology, reproduction, or political life should be.

Conclusions

Women participated in AT in equal numbers to men, but historians have not recognized their contributions and experiences. These white women were part of a larger social, economic, and cultural shifts in women’s citizenship, as throughout the 1970s they entered higher education and the paid work force in increasing numbers. They also gained further control of their reproductive lives, as divorce became more common, abortion was legalized, and the pill came

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to be widely available. The AT movement opened spaces for women to gain professional experience, participate in the production of scientific knowledge, and gain social and economic equity in groups that constructed self-empowered technoscientific citizenship. Their long-standing political views, which did not emerge only out of a reaction to their treatment by male peers, led them to embrace the practices of second-wave white feminism. Cold War nuclear fears, New Left politics, WSP participation, Civil Rights, and Vietnam all influenced these women’s views.

The promise of ecological design and appropriate technology, however, may not have reverberated as far beyond the groups themselves as they would have liked. As discussed in the previous chapter, gendered imagery came to indicate the opposite of women’s liberation: that living in ways that cared for the earth would not overturn established social, political, and economic hierarchies. As AT became woven into the mainstream, women’s ecological domesticity, rather than technoscientific citizenship, came to dominate the ways women could care for the earth.
CHAPTER 5
“SPACE AGE ARK, BRAVE NEW HOME”: MAKING ECOLOGICAL DOMESTICITY MAINSTREAM

In 1977, journalist Constance Mungall wrote a description of an “ecologically designed bioshelter powered and heated by the wind and the sun” for the women’s magazine Chatelaine. Mungall described this “space age ark,” which combined gardens, aquaculture tanks, and living spaces, as a place in which she “couldn’t escape the knowledge that we depend on nature for our comfort … [and] got high on the thought we were working with the wind and the weather to form our own mini-environment,” free from “anonymous utilities.” When Mungall and her son returned to Toronto, they turned down the heat in their apartment and began composting again, as that would “have to do until we can build our own Ark.”

The “Ark” on Prince Edward Island was the invention of the New Alchemy Institute (NAI), an Appropriate Technology group founded in 1969 by Nancy Jack Todd, her husband John Todd, and their friend and colleague William McLarney. They began NAI as scientists and artists who wanted to make social change by incorporating ecological processes into technologies that provided food, energy, and shelter. They intended NAI to “Restore the Lands, Protect the Seas, and Inform the Earth’s Stewards,” and envisioned their bioshelters as places to merge science and domestic life, such that “through the tending of them [they would] teach their inhabitants how the larger world works.”

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326 This slogan became the masthead for the Journal of the New Alchemists. Historians fail to include Jack Todd as a co-founder of NAI, mistakenly only listing McLarney and Todd to highlight the scientific leanings of NAI. New Alchemy Institute Newsletter, No. 1 (Summer 1972): 3. In Box 33, Folder 2, New Alchemy Institute Records (MS254), Special Collections and University Archives, Iowa State University, Ames, Iowa (hereafter NAI-ISU).
By the late 1970s, the New Alchemy Institute had grown into an internationally known organization with over 2,000 members on five continents and 20 countries. They had successfully built two “bioshelters,” buildings that contained agriculture, aquaculture, and living spaces. They had received funding from both the Canadian and United States’ federal governments as well as foundations such as the Rockefeller Brothers Fund. The Todds were friends of Stuart Brand, *Whole Earth Catalog* founder, as well as acquaintances with anthropologist Margaret Mead and scientist-philosopher Gregory Bateson. They attended Murray Bookchin’s Institute for Social Ecology and were invited to the Stockholm Environment Conference in 1972. They moved easily between the worlds of grassroots activism and powerful institutions. And yet by the end of the 1970s, NAI stood precariously on the edge of organizational dissolution, fueled by the rapidly changing economic and political landscape of that era.

In this chapter, I discuss the ways AT groups promoted their work to a wider public through the story of NAI and its struggles to find funding. The chapter begins by describing the ways NAI connected their work to social activism. They built their technologies on ecological principles and saw inviting nature into homes as a way of expanding stewardship for the earth. The chapter then turns to the ways NAI gradually gained support from institutions beyond countercultural networks. Yet when their technologies appeared to the wider public, the radical potential of expansive technoscientific citizenship was undone through gendered imagery and the invocation of feminine ecological domesticity. This was particularly true of debates over the PEI Ark: NAI intended it to be both a scientific research institute and a home. However, articles described the Ark in ways that affirmed white, middleclass, heteronormative domesticity and the

328 NAI member list, 1979, Box 32, Folder 5, NAI-ISU.
329 Trim, “A Quest for Permanence,” 164.
masculinity of science. The cultural valences of “home” undercut the project’s scientific credibility, as a place could not be both scientific and domestic, while ensuring that caring for the earth would not overturn existing social, cultural, or economic norms.

Alchemical Beginnings

According to Nancy Jack Todd, the idea for the New Alchemy Institute began on September 12, 1969, when she sat reading Paul Ehrlich’s article “Eco-Catastrophe!” in the journal Ramparts. “Eco-Catastrophe!” argued that ecological collapse would lead directly to social and political crises.330 Jack Todd looked up at her husband and exclaimed: “John, we must do something.” She recalled, “With that, I felt a familiar twinge, and the preliminary labor contractions that heralded the birth of our third child, Susannah, began. I was momentarily distracted from my other mission, but since then I have come to think of it as something of a twin birth.”331 This “creation myth” encapsulates the philosophy of NAI’s science and its social goals. In it, Jack Todd merged bodily knowing with intellectual inspiration, just as NAI would go on to argue for undoing dualisms of science and art, and masculinity and femininity, among others. She also made women’s ability to create knowledge central to the founding of the Institute. Throughout the 1970s, NAI worked to expand technoscientific citizenship by incorporating ecological processes into agriculture, aquaculture, and homes. They argued that material personal autonomy could provide political power and social change.

330 Paul Ehrlich, “Eco-Catastrophe!,” Ramparts Magazine (September 1969). Ehrlich was a proponent of neo-Malthusian concepts underlain, as historians have shown, with racial concerns. Many historians discuss the concerns over limited resources and human population growth, and the ways these dovetailed with racist governance practices. Fewer have discussed the gendered and racial impacts of resource use in homes. Robertson, The Malthusian Moment, Chapter 6; Murphy, The Economization of Life; Bashford, Global Population.
While Jack Todd suggested NAI emerged in a moment of intense (and laborious) inspiration, the origins of NAI lay in “a decade of discussions and gatherings on the part of a small group of scientists, artists and humanists … [who] were deeply unhappy with society’s present course and were searching for ways in which a small group might aid in creating a saner world.”

Jack Todd had been politically engaged for years. Born in South Africa, Nancy Jack Todd [née Nancy Joanne Jack], grew up “haunted by the horror of war and violence.” In high school, she watched the antinuclear demonstrations in England and became increasingly active in antinuclear politics. This concern carried on to her protesting the Vietnam War. When living in Ann Arbor while John Todd was a graduate student, Jack Todd joined Women for Peace, participating in “countless meetings, lectures, [and] demonstrations demanding an end to the war” once her husband was home for the evening. Her husband, John Todd, had a background in ethology, tropical medicine and parasitology, comparative psychology, and oceanography. The Todds had become close friends with another graduate student in Ann Arbor, William O. McLarney, who also moved to San Diego after completing his doctoral degree to take a faculty position.

While Todd worked at the university, Jack Todd cared for their children and was, in her words, seen as a “raving lunatic” by her neighbors, as “they’d see [her] coming down the street, and they knew [she] was going to go on another diatribe about the amount of lead from car exhaust.” Watching the smog in San Diego and worrying about her children and children around the world, Jack Todd recalled, was “the beginning of my slowly dawning awareness of

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332 New Alchemy Institute Newsletter (Fall 1970): preface, Box 33, Folder 2, NAI-ISU.
333 Todd, A Safe and Sustainable World, 7.
334 Todd worked with Marston Bates and John Bardach at the University of Michigan. The relationship between Bates and Todd, as well as between Bardach and Todd, needs to be more fully explained. Bates had worked for Rockefeller Fund in tropical ecology, Bardach published several papers with Todd on the chemical communication of the yellow bullhead, Ictatalurus natalis, John Todd CV, Box 21, Folder 9, WER.
humanity’s utter dependence on the biological life-support systems of the natural world.”336 By the late 1960s, the Todds and McLarney were participating in Ecology Action events, spending evenings discussing the impact of technologies on ecologies. While NAI had been incubating for years, the founders often relied on two stories to explain what finally pushed them to begin NAI. In one, Todd’s research on DDT’s destruction of social communication in yellow bullheads (a fish) led him want to find alternatives to the “death science” in which he was participating. In their other origin story, homesteading friends could not find ways to live successfully on their land. These narratives pointed to the violence of conventional science and its lack of practical applicability. The Todds and McLarney thus wanted to find ways to support “individuals or small groups … [in] creat[ing] a greener, kinder world.”337

In 1970, NAI existed primarily on paper, a collection of friends sharing projects and information about their work. But that year, the Todds and McLarney moved to Cape Cod for work at the Woods Hole Oceanographic Institute. They had not intended to make the Cape a permanent location for their work. They became “charm[ed],” however, by the Cape and decided that to fully create the “environmentally adapted communities” they imagined, they needed land and a research center.338 While they spent time building aquaculture tanks in basements and domes in various backyards through 1971, in 1972 they secured land by renting a property in

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336 Todd, A Safe and Sustainable World, 7.
337 For Ecology Action reference, see Todd, A Safe and Sustainable World, 8. For the quote, see “Purpose,” New Alchemy Institute Newsletter (Spring 1972): 3, Box 33, Folder 5, NAI-ISU. For several versions of these narratives, see Todd, A Safe and Sustainable World, 8-10; Todd, “New Alchemy: Creation Myth and Ongoing Saga.” John Todd had long been interested in agricultural regeneration. The idealization of agricultural landscapes stayed with NAI. Anderson, “New Alchemy.” John Todd had also become disillusioned with academia when the university did not fund his vision for an environmental studies program. Patrick Rivers, “Interview with John Todd,” in Radical Technology, ed. Peter Harper and Godfrey Boyle (New York: Pantheon Books, 1976).
Hatchville, Massachusetts. That summer they planted their first gardens and began experiments in aquaculture as well as wind power.339

Science and Society at New Alchemy

“A ragged band of children hovers[ed] on the crest of the hill … In the field below, their parents and friends are hunched over tiny plants,” reported Jack Todd in a fall 1972 newsletter, continuing that “the scream of jets from the near-by air force base can shatter only momentarily the karmic [sic] high we are on.”340 That summer, the Alchemists gathered friends and new acquaintances to build solar-power washing machines, dream of outdoor kitchens, begin fish farming experiments, design windmills, and plant gardens. By the time the season ended, “so much that was fantasy or plan or theory … edged into the realm of reality.”341

At their farm, the “Alchies,” as they called themselves, focused on the goal of developing “food producing and energy systems that do not require large amounts of capital so that …findings [could] be widely utilized by those without substantial financial resources.”342 They experimented in aquaculture (raising tilapia and learning how to grow food for these fish on their own farm) and agriculture (in fertility management and pest control).343

340 New Alchemy Institute Newsletter (Fall 1972):1, Box 33, Folder 5, NAI-ISU.
341 New Alchemy Institute Newsletter (Fall 1972): final page, Box 33, Folder 5, NAI-ISU.
342 Todd, “The New Alchemists,” 56. This article was based on a talk he gave at the Limits to Growth Conference in 1975 and also drew on a statement he sent to Gerald O. Barney of the Rockefeller Brother’s Fund to explain NAI’s work. Stuart Brand’s introduction says it was “a statement more definitive than anything they’ve done even in their own publication The Journal of the New Alchemists (55).” Todd to Gerald Barney, October 2, 1975, Box 706, Folder 4225, RBF FA 005 RG3 Series 1, RAC. Todd’s background lay in animal communication and he had a life-long interest in agriculture, while McLarney was in the middle of writing what would become the primary guide to aquaculture in the United States. Their focus on agriculture and aquaculture stemmed from these professional interests.
343 See the Journal of the New Alchemists for reports on their work. Most historians give an account of their technologies; few spend any time with their social networks.
integrated ecological processes with technologies such as computers, insisting that they were creating tools that were less easy to commodify and therefore presented “a future [that is] more egalitarian and considerate.”

For the New Alchemists, science had to come out of particular ecosystems and relate to specific cultural, social, and economic milieus; they worked against, therefore, a concept of placeless objectivity and argued that scientific knowledge and technological innovation had to emerge from sets of relations, a contextual activity that supported diversity. To this end, they imagined a network of research institutions each in a distinct ecosystem and social setting. In their first years, these research nodes existed in Massachusetts, New Mexico, Costa Rica, and California. They also ran a “Readers’ Research Program” to counteract what they saw as the destructive power of the scientific establishment. “For too long science has been the pastime of an elite working on behalf of its government or corporate patrons,” they wrote, “with little concern for the social or environmental impact of the technologies that have been created.” What they intended to create was a “new science for social and biological microcosms,” one that initiated “an ethically oriented science for the earth.” In this research program, they encouraged people to undertake specific aqua- and agricultural experiments in their homes and report back to the group. Funding from the Rodale Press dried up in 1973, preventing further development of this early citizen science project.

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344 Todd, “The New Alchemists,” 56. In the version of this article that Todd send to the RAC, Barney asked in a marginal note that this “Requires sharp shift in values; how promise?” Todd to Gerald Barney, October 2, 1975.
345 Donna Haraway suggests the term “situated knowledges” to replace idea of knowledge created either one-place (“god-trick”) or no-place (relativism). Haraway, “Situated Knowledges”; Daston and Galison, Objectivity.
346 New Alchemy Institute Newsletter (Spring 1972): 3, Box 33, Folder 5, NAI-ISU.
As the Readers’ Research Program demonstrates, NAI’s science can only be understood through their social goals. They envisioned decentralized communities, developing concepts of society that focused on the “micro level while maintaining a planetary perspective,” arguing that change should occur at the “lowest functional units of society, the individual, or small group, and the elements which sustain them.” They looked to food production at “a family level, which would be ecological and relatively inexpensive.” These were arguments for personal independence through technoscientific control; a political power based on material freedom.

Connecting collective responsibility to personal autonomy underlay these experiments in ecological living. According to Todd, they were “working towards a greater degree of community so that [their] science could kindle and nurture the talents of everyone who worked with [them].” “Common leadership” would allow people to lead when they had “the most interest and information.” Todd described this form of organizational structure as one “based not upon age, the passports of society, or seniority, but upon more elusive and valuable criteria intrinsic in all of us at our best.” For these activists, science needed to be accessible. They wanted “to make the search for useful knowledge less sacrosanct” and “directly usable by the public.” That they “communicate[d] directly and purposefully with the public,” they reported, “caused resentment amongst some of our scientific peers.” As Todd ended his talk at the “Limits To Growth” Conference in 1975, “It is becoming apparent that a science of steady states is needed to prepare us for the future. It will be different from the one we now know, having

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350 John Todd, “Realities from Ideas, Dreams and a Small New Alchemy Community,” New Alchemy Newsletter (Fall 1972): 5, Box 33, Folder 5, NAI-ISU.
353 Todd, “The New Alchemists,” 62
been created within a framework of ethical and moral considerations. There is emerging a widespread interest in building a future in which the majority of people are participants rather than spectators. If this is so, the work of New Alchemy and others like us may come to be considered relevant to the questions and problems of our time.”

People arrived from a variety of backgrounds to join the projects at New Alchemy. By 1976, they had 16 people on staff as well as volunteers. People at the Institute included former conscientious objectors to the war in Vietnam and Vietnam veterans; biologists, engineers, philosophers, agriculturalists; people from Canada, the Netherlands, and the United States; concert violinists and those with English degrees. While Jack Todd suggested that these individuals and the thousands that came to see their work on open farm Saturdays were “gravitating to the ideas [which] were in the air,” many arrived through existing social and professional networks. The influence of the Woods Hole Oceanographic Institute cannot be overstated, not only for the Alchemists’ scientific community but also as it drew people to Woods Hole for professional positions. Denise Backus and Christina Rawley arrived on the Cape as single mothers looking for work; WHOI employed them before they moved on to NAI. The

355 Todd, “The New Alchemists,” 64. A memorandum from Michaela Walsh to RBF in July 1975 notes that the staff was 18. Michaela Walsh, “New Alchemy Institute,” July 24, 1975, Box 706, Folder 4225, RBF FA 005, RG3 Series 1, RAC.
357 Todd, A Safe and Sustainable World, 14.
358 Backus, interview; Rawley, interview.
Todds and McLarney originally moved to work for WHOI and others were connected to the group through WHOI.

At New Alchemy, all people were paid the same amount no matter their degree ($9,000 by 1975, with an additional allowance for dependents), and they insisted that while they were a “scientific organization” they “did not wish … to be dominated by scientists.” In 1976, out of 16 staff, equal numbers of men and women worked at NAI, about one-quarter of them (the men) held doctorates and focused on aquaculture and engineering, while women headed publications, administration, and agricultural research.359 That women earned the same as men represented a major break from economics of the 1970s, when pay had not even begun to inch toward parity.360

The group made decisions at weekly Wednesday meetings, which could become long and tedious but were also essential to the shared decision-making practices and to know how various projects could be linked together. As Hilde Maingay, head horticulturalist, remembered, “at New Alchemy everybody was involved in everything. You had your main project but if somebody in composting department needed help then you helped there, [or] the people in aquaculture then you’d help there … So that was also really important part of New Alchemy because you learned how things are connected.”361 Such consensus decision-making proved crucial for women to gain an equal voice within the organization.362 Despite the fact that in the first few years, there existed some “dischord [sic] and disharmony” due to the fact that “people were with us for reasons that

360 Goldin, “The Quiet Revolution.”
361 Maingay, interview. This view undercuts Henry Trim’s argument of the centrality of John Todd’s leadership. See Trim, “A Quest for Permanence.” While it is true that John and Nancy retained most of the power to publicize and fundraise for the group, and often held final say over projects, many women I talked with felt that they were fully in control of their research and that they worked together to make this possible.
362 As will be discussed later, a move away from consensus towards a hierarchical pay structure caused consternation, particularly among women. See “What Does NAI Mean?,” Box 38, Folder 12, NAI-ISU.
differed fundamentally from the rest, most of the people became life-long friends. People found both community support and fulfilling professional lives at NAI. They also felt they were working to build a changed world.


For the women at New Alchemy, the promise of self-determination, scientific professionalism, and equal voice came not through images of holistic ecological living but persistent action regarding organizational roles. From the earliest *Journal*, Jack Todd envisioned

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363 Likely this referred to Jelle Atema, a colleague of John Todd’s who was married to Hilde Maingay. A biologist who focused on sensory perceptions, he published papers with Todd and Bardach and worked at WHOI. Maingay reports separating from Atema in 1970, but she retained her married name for several years after. For quote, see Todd, “Realities from Ideas, Dreams and a Small New Alchemy Community.”

364 Essentially all my interviews reflected this sentiment, despite acknowledging of community tensions.
“the possibility of drawing on the enormous potential energy of the women’s movement.” The centrality of women’s labor cannot be understated. Jack Todd edited NAI’s publications; Hilde Maingay and Susan Ervin ran agricultural experiments; Christina Rawley and Denise Backus took care of the office work, to name just a few. Women’s presence at NAI led Jack Todd to comment that “John [Todd] and Bill McLarney … were both articulate and charismatic and projected an image that was radical and compelling. But being male, they did not fully reflect the reality of the group.” Women cultivated, weeded, harvested, and preserved the food grown at New Alchemy (Figure 13). They were also scientists, as they conducted trials of crop yields under various fertilization and pest management treatments. As Maingay recalled, “And that is why we had such a diversity of people coming in here. English majors that started doing stuff on composting or whatever. It didn’t matter, you had a good idea, you’re smart, you can figure it out, you can read up on it, you can write, then you proceed. It didn’t matter if you were young, old, female, male.”

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366 Todd, A Safe and Sustainable World, 73.
367 Maingay, interview. Extensive scholarship debates the relationship women (of all kinds) have to knowledge production, embodiment, social relationships, etc. Donna Haraway’s “situated knowledges” is a seminal concept in this field. More recent scholarship expands and critiques such work. MacGregor, Beyond Mothering Earth, Chapter 4; Joan Wallach Scott, “The Evidence of Experience,” Critical Inquiry 17, no. 4 (Summer 1991).
Beginning in 1974, the New Alchemists started designing buildings that incorporated all aspects of their agriculture, aquaculture, and energy experiments. They termed these “Arks,” or “bioshelters,” spaces that could contain a diversity of life that would sustain humans during an ecological apocalypse (Figure 14). Architects Sean Wellesley-Miller and Day Chahroudi used the term “Bioshelter” to describe buildings “designed not only to provide shelter from the weather, but also provide some food; fresh water; liquid and solid waste disposal; space heating and cooling; power for cooking and refrigeration; and electricity for communications, lighting, and household appliances.”

Marston Bates, an ecologist and Todd’s mentor at the University of Michigan, also inspired these structures with his own “miniature tropical ‘rainforest’” in

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Ann Arbor. He likely provided some of the intellectual groundwork that NAI followed in its designs: Bates had been arguing for technologies that “exploit[ed] the possibilities that must be latent in the environment” that could be made use of through establishing centers in specific cultures and ecosystems. Additionally, Bates depicted the divide between science and the humanities as a “false dichotomy,” much as the New Alchemists did.

The New Alchemists argued that all people should be able to participate in technoscientific control and that their technologies cultivated self-sufficiency and earthly care. They depicted these as radical techniques for living on a planet in crisis. Their metaphors of technological change allowed them to capitalize on a shift in international governance toward global environmental management, prominently manifested at the United Nations Conference on the Human Environment held in Stockholm in June of 1972. The Todds had been invited to participate in the Stockholm conference by Peter Harper, an AT activist from England who had recently participated in a “crisis committee” organized by the biophysicist and philosopher of science, John R. Platt at the University of Michigan. In addition to the ways they framed their work, NAI remained closely connected to international scientific circles through personal relationships. They deliberately cultivated connections to prominent foundations and national governments to promote their ecological technologies, particularly their bioshelters.

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humans and the non-human world, insisting that science itself needed to be seen as a humanistic pursuit. Megan Raby, “‘From Mosquitoes to People’: Marston Bates and the Rockefeller Foundation International Health Division,” in *Rockefeller Archive Center Research Reports* (Rockefeller Archive Center, 2019).


373 “Potpourri of Alchemy,” *New Alchemy Institute Newsletter* (Spring 1972): 18, Box 33, Folder 5, NAI-ISU. A connection to John Platt, who likely knew Todd at the University of Michigan, might explain the connection between Todd and Harper.
NAI’s Cultivation of Counter-Cultural Networks

Before the New Alchemy Institute even had land of its own, John Todd began promoting the Institute to funding organizations. “This letter is to introduce ourselves,” wrote Todd to the Rockefeller Brothers Fund, “and to inform you that we are active in aquaculture research and plan further studies in a wide variety of climates in North and Central America.” He continued, noting that they had begun NAI “to permit a number of concerned scientists to help create low-cost, energy, aquaculture and agriculture systems.”

The Fund could not, at that time, aid NAI with its “biotechnic design and research programs” yet the persistence that Todd showed in writing the RBF continued. The Alchemists, perhaps more than most AT organizations, excelled at capitalizing on the zeitgeist of the 1970s. They worked diligently to promote their work in the language of the time. And, in just a few short years, this work began to pay off.

In their early years, the Alchemists mainly gained support and media attention from other countercultural organizations, especially Stewart Brand and the network he had built around the *Whole Earth Catalog*. Todd met Brand in 1972, writing to him that “I am glad that we finally had a chance to meet and I could tell you how much I admired the ‘dynamic’ you set in motion on behalf of this ol’ planet.” Even in this first correspondence, Todd focused on funding opportunities and various ideas – for instance, an oceanic equivalent of their terrestrial technologies – suggesting that Brand serve as “herald” for the group to funders. Brand’s friendship – and it was a close friendship, with coast-to-coast visits, letters signed “love,” shared

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374 John Todd to James Hyde, July 12, 1971, Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC. It is likely that Todd thought of the RBF as one of his mentors, Marston Bates, had worked for decades for the Rockefeller Foundation.

375 William Moody to John Todd, August 19, 1971, Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC.


377 Todd to Brand, November 22, 1972, Box 7, Folder 1, SPB.

378 Todd to Brand, November 22, 1972; Richard Merrill to Brand, March 25, 1973, Box 7, Folder 2, SBP.
dreamscapes, and trips to Cape Breton, Nova Scotia – helped secure early funding for the Institute. Late in 1972, Brand was already promoting Todd as “the best of the soft technologists in America. He is a first-rate biologist doing the most innovative work in down-home protein production (using forced fishponds) along with excellent work in solar and wind energy and commune design.” Brand also provided needed funds from his Point Foundation and helped secure other grants.

Despite some promising early funding, in the early days of 1973 the Alchemists faced financial difficulties. The Rodale Press, which had funded NAI’s “Readers’ Research Program,” pulled their funding, leaving NAI without money for salaries or their farm rental. For Todd, the lack of funds meant an inability to continue a project he felt integral to their work: “I personally believe that cadres of lay people seeking the answers to problems relating to their own lives and a microcosmic sense of scale is one of the best ways out of our present mess … everybody should be a discoverer, and it was a beginning … damn damn damn.”

While Brand may have provided integral social connections, the Alchemists, and particularly the Todds, were continuous self-promoters who wanted to make themselves indispensable sources of information for people looking for alternatives to conventional homes, backyard gardens, and lifestyles. They began publishing their work in a (nearly) annual book-length journal, The Journal of the New Alchemists, in the fall of 1973, whose issues eventually ran to over 100 pages. They immediately turned to Brand for publishing advice: “Our plan is to run 1,000 copies … then send the JOURNAL to a number of potential distributors (do you have

379 Brand wrote this in a letter to Ernst Winter, a “post-war pioneer in organics” who had moved back to Liechtenstein after years of living in the United States after the “constant malaise” of the 1950s left him feeling that he would not be able to influence “the establishment.” Winter, an advisor to the Canadian politician and UN ambassador Maurice Strong, may have introduced the Todds to Strong, who later helped save their farm. Brand to Winter, December 13, 1972, Box 7, Folder 1, SBP; Winter to Brand, November 8, 1972, Box 7, Folder 1, SBP.
380 Todd to Brand, January 3, 1973, Box 7, Folder 2, SBP; Todd to Brand, June 21, 1973, Box 7, Folder 3, SBP.
381 Todd to Brand, April 4, 1973, Box 7, Folder 2, SBP.
any leads for us?) asking them if there might be a larger audience for our ideas and publication, and would they distribute … Would a distributor like Random House, Mother Earth or Garden Way have any knowledge of a potential market?”  

The “Alchies” also gained attention through their collaboration with John Todd’s sister, Dorothy Todd Hénaut, a film maker who worked for the National Film Board (NFB) of Canada. In 1973, she arrived at the Cape Cod farm to make a video for the NFB’s “Challenge for Change” series. Hénaut described the film as being “about survival technology … Windmills, solar energy, back yard fish farms and intensive organic gardening could help a family survive in time of grave crisis – and in the meantime could make them feel more whole, more in tune with their environment, and less dependent on gigantic forces they can’t control.” By 1975, Nancy Jack Todd could declare the film an “unqualified success” as it had been “shown to concerned citizens, educators, community organizers and environmentalists, to people in food co-ops, agriculture classes, women’s groups, film festivals, ecology classes, Church groups, food and energy conferences, to back-to-the-landers, senior citizens, gardening groups and to native peoples.” She claimed that it had inspired roof top gardens, activism against urban pollution, the formation of an environmental group, and increased awareness of nuclear dangers. As the promotional pamphlet for the film declared, the “message is simple and optimistic. You needn’t

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382 Todd to Brand, August 9, 1973, Box 7, Folder 3, SBP; Todd to Brand, September 18, 1973, Box 1, Folder 3, WER. Stephen Mannell describes the Journal as “photographs of community activities: potluck meals and celebrations, work in the gardens, fishponds, or raising a wind turbine. Photographs show gatherings of hippie-looking folk with long hair and beards, beads on bare chests, bikini tops and long skirts and short shorts, and beautiful young children taking part in everything.” These, along with “stream-of-consciousness articles on the life and times of the New Alchemists, led many to presume they were a back-to-the-land commune.” Mannell, Living Lightly on the Earth, 40-41.

383 Hénaut to Brand, February 11, 1974, Box 1, Folder 3, WER.

be afraid to try … You needn’t only rely on experts … You can make alternatives work for you.”

The gardens, windmills, aquaculture tanks, and bioshelters, however, gained traction not only from these persistent publicity measures but due to a geopolitical event that altered the policy landscape for the rest of the decade: the increase in oil prices that people blamed on embargos put in place by the Organization of Oil Exporting Countries in the fall of 1973 to protest United States’ support of Israel in recent conflicts. In a few short months, the price of oil rose from $2.59 a barrel in October 1973 to $11.65 in January of 1974. As the geographer Matthew Huber argues, the oil crisis was not only a crisis of capital but, as oil formed the basis for technologies that underlay many people’s identities, a crisis of the “American way of life.”

Suddenly, alternatives to the inflated cost of oil came to be both politically and economically desirable. Was it the responsibility of government or citizens to find ways beyond energy scarcity? What was the relationship of scientific governance (technocratic decision-making) to the autonomy of individual citizens? Would the dearth of oil result in the collapse of middle-class society?

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386 The crucial source for understanding the rise of oil prices is Mitchell, Carbon Democracy. Mitchell shows that the oil crisis was not, in fact, due to the embargo but likely due to the planned increase in taxation that occurred nearly simultaneously. He also focuses attention on the policies put in place by Western governments, suggesting that the policies, rather than the embargo, created the sense of oil shortages. Oil companies, Mitchell contends, created a sense of scarce reserves to maintain political power and profits. Felicity Scott also underscores the political essence of resource debates. Scott, Outlaw Territories.
387 Borasi and Zardini, Sorry, Out of Gas, 50.
389 Caleb Wellum suggests that there were two competing narratives of energy conservation in the 1970s, the national and the ecological. In the following discussion, I contend that the ecological was national, as ecological metaphors relied on nationalist tropes. Wellum, “A Vibrant National Preoccupation.” Henry Trim frames his discussion of NAI through the lens of technocratic governance. Groups such as the New Alchemy Institute, I would argue, attempted to find a middle way between rationality of technoscientific governance and the promise of radical participatory democracy by contending they were scientists and insisting that all people should be engaged in creating the material world they lived within. Henry Trim, “Experts at Work: The Canadian State, North American
Capitalizing “The World in Miniature”: The New Alchemists and Mainstream Funding

The shift in public concern related to energy and environment meant that by early 1974, groups such as NAI were receiving increasing media attention beyond those outlets focused on countercultural and back-to-the-land communities. While the *New York Times* had reported on the Alchemists’ fish production as early as September of 1973 (“Farm-Grown Fish: A Triumph for the Ecologist and the Sensualist”390 blared the headline), articles truly began to flow after the oil crisis made energy a top media story. A February 1974 article for the *Canadian Magazine* brought in hundreds of new affiliates to NAI.391 They were soon published further in the *Times*, in the *Smithsonian Magazine*, in *TIME*, and in *Science*.

In articles intended for a wider public, NAI’s desire to give all people access to technoscientific control was undercut by gendered depictions of their work. Articles described the New Alchemists as scientific men creating technologies that would ensure the independence of male homeowners in an oil-scarce world. Early magazine accounts focused on the do-it-yourself masculinity of NAI’s technologies and the rationality of their scientific endeavors. The *Smithsonian Magazine* assured readers that the New Alchemy Institute was, “despite the sound of its name, … not a band of well-meaning, mystical communards in flight from the realities of science and society …[but rather] a group of thoroughly rational professionals seeking to apply the insights of science on a smaller, human scale.”392 Lest we forget just who those scientists were, the *New York Times* told readers that NAI was founded by “a group of oceanographers from nearby Woods Hole and wives and friends, all profoundly disturbed by the cancer of

pollution.” Articles reported that anyone who could “tinker with an automobile engine” or who owned a “basement shop” could construct their ecological technologies. Rather than the promise of reversed gender roles, depictions of men with beards and scientists at work suggested the masculinity of the research undertaken at NAI and reaffirmed men as the correct conduits for scientific rationality.

In addition to the male scientists constructing alternative energy sources, articles suggested that energy scarcity directly threatened the independence of male homeowners. “You’re sitting in your home, cold, hungry, and helpless,” began the Canadian Magazine article, “Staggered by the realization that you can’t provide food and warmth for yourself and your family. You’d worked hard, you’d made good money, and you thought you were self-sufficient. But now that you can’t buy what you need you’re a total loss.” The “homeowner” in these articles was encouraged to adopt technologies of “self-sufficiency” to combat the possibility of energy scarcity and the resulting threat to his economic, familial, and political power. Historian Trish Kahle argues that energy citizenship as constructed through energy production was a white, male preserve. However, white male citizenship was also constructed through access to energy, and energy shortages threatened the masculine prerogative of independence as enacted through control of his home.

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393 This article focused on the aesthetics of NAI’s farmed fish, asking “Can a family grow a year’s supply of fish in its back yard at negligible cost? Will the fish be good to eat?” Hess, “Farm-Grown Fish: A Triumph for the Ecologist and the Sensualist,” 32.
395 Gelber, “Do-It-Yourself.”
396 Hughes, “The World the Feeds Itself,” 2.
397 Huber argues that the oil crisis directly called into question the “American way of life” based on fossil fuel social reproduction. The many examples in his book reflect the gendered aspects of oil-as-life. Huber, Lifeblood. The rhetoric of independence through home ownership resonates with long-standing cultural narratives in the United States, as we could connect homeownership and self-sufficiency back to Jeffersonian agrarianism and the promise of democratic politics through yeoman farmer’s independence. Kahle, “The Front Lines of Energy Policy.”
By 1974, the Institute was not only gaining international attention but also becoming increasingly connected to communities of counter-cultural activists and strengthening their ties to funding organizations. They began participating in Murray Bookchin’s Institute for Social Ecology, where John Todd became inspired by Howard Odum’s arguments that energy scarcity would directly affect agricultural yields. They also first attended William Irwin Thompson’s Lindisfarne Institute in the summer of 1974 for the gathering on “Planetary Culture and the New Image of Humanity.” John Todd gave a talk reflecting on the work of NAI, alongside such notables as E.F. Schumacher, Russell Schweickart (astronaut), Elise Boulding (women’s historian), Saul Mendlovitz (director of the Institute for World Order), and Richard Falk (Princeton law professor and author of This Endangered Planet), a meeting that would lead to a decades-long collaboration between Thompson and the Todds and introduce a Rockefeller Brother’s Fund program assistant, Michaela Walsh, to NAI’s work. As Walsh noted in an interview, “I was blown away by what [Bill Thompson was] doing … that was when I first met the Todds. And I went back, and I was determined to see a small grant go to them … I put together 25,000 dollars, and one of the Rockefellers said, ‘New Alchemy? Isn’t that something out of the middle ages?’ Anyway, they gave 20,000 towards it in the first grant.”

Walsh, who became a program officer for the Rockefeller Brothers Fund in the early 1970s, had spent the previous decade working for Merrill Lynch International, in Beirut from 1960 to 1965, and then worked on Wall Street for a hedge fund while attending night school at

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398 Micheala Walsh, interview by Emma Schroeder, March 2, 2020. In fact, the Lindisfarne Association led the Todds to connect to a wide variety of people, many of whom later wrote pieces in the JNA. The Lindisfarne lectures are available online. “Lindisfarne Tapes,” https://centerforneweconomics.org/envision/legacy/lindisfarne-tapes/. According to Jennifer Thomson, Lindisfarne was created by Thompson to be a place for those “dedicated to engendering a global culture.” Little has been written about Lindisfarne, but it served as a meeting place for a number of influential environmental thinkers. Thomson suggests that it remained an “insular” group that “never succeeded at launching a new Gaian-informed planetary politics.” Thomson, The Wild and the Toxic, 105-106.

399 Walsh, interview. In fact, RBF gave $50,000, $30,000 for 1974 and $20,000 for 1975, approved November 22, 1974. Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC.
Hunter College, where she received her BA in 1971. She recalled “that I was on the ascending ladder for what the United States was trying to encourage … a new global economy.” She left the world of finance for “moral reasons” in the early 1970s. An acquaintance asked if she wanted to work in the foundation world and she agreed, remembering that she “had access to all these thoughts about how the World Bank was set up and how finance is working in new ways. And I just did whatever they needed done.” Or, as “one person in the office used to say, ‘Oh, Michaela does all the garbage.’ Because everybody had a specific program assignment, I was brought in as the first program officer, who was a woman, and I was doing all the stuff that nobody else wanted to do.” Walsh’s work focused on alternative technologies and groups who often did not have access to foundation support; as she recalled, she introduced many in the San Francisco area to the foundation world.400

Walsh’s tenure at the RBF overlapped precisely with the Fund’s embrace of an environmental program that moved beyond conservation and population management. In the 1974 Annual Report, RBF declared that a “paradigm shift” in science had taken place, as “the shocks of the recent past -- the reports of famine, evidence of pollution, unassimilated waste, shortages of energy and other resources -- produced a new general awareness of relationships among parts of the natural system” and created a “unified environment program”401 to deal with this new awareness. Famines in Bangladesh in 1974, the OPEC energy crisis, models such as Meadows et al.’s Limits to Growth (1972), and an increasingly decolonizing world that required novel geopolitical negotiations over resource use all must have played a role in RBF’s decision

400 Walsh, interview.
to turn to combine their previous support of conservation and population programs into an environment program.\textsuperscript{402}

The shift in RBF funding programs benefited groups such as NAI and Lindisfarne.\textsuperscript{403} But the Institute’s ability to access such funding required a new emphasis on what Todd called the “food-space-energy problems”\textsuperscript{404} in a presentation to the RBF in October of 1974, as opposed to NAI’s longstanding aim of democratizing technoscientific production. According to Walsh, Todd insisted that “the ecologist, O.T. \textit{sic,} H.T.] Odum’s recent suggestions that energy shortages in agriculture could result in severe food shortages in the not too distant future has led many to accept the fact that if food demands are to be met in the coming years, indigenous ecologically derived and low energy strategies for raising food are going to have to be developed.” When people listening to this presentation of NAI’s work, particularly their integrated “bioshelter” designs, questioned “the practicality of a layman attempting to construct and maintain such a complicated system as well as the basic economics,” Todd insisted that “crises of world famines and energy shortages” made their work essential.\textsuperscript{405}

When RBF awarded NAI a grant of $50,000 in November of 1974, the board’s minutes linked NAI’s work to problems of international food production and energy use rather than their citizen science of domestic spaces: these “highly respected professional scientists” were “appl[y]ing advanced concepts of science and capital-conserving construction techniques to produce an impressive array of new technology … the New Alchemists’ solar-heated, wind-powered farm produces a flavorful, high-nutrition yield.” Such work promised to benefit people

\textsuperscript{402} Here again, we see that the population debates and the technologies promoted by the NAI were not far removed. The concerns over limits to the Earth’s resources could either be seen as due to too many humans or humans using the wrong kinds of technologies. Michelle Murphy discusses the famine in \textit{The Economization of Life}.

\textsuperscript{403} Also funded Farallones, Zen Center, etc. See \textit{Rockefeller Brothers Fund Annual Reviews} for the 1970s.

\textsuperscript{404} Walsh memorandum to RBF files, November 22, 1974, Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC.

\textsuperscript{405} Walsh memorandum to RBF files, November 22, 1974.
“throughout the world” and also fit the RBF’s environmental program’s goal to support “new, environmentally sound values, life styles [sic] and tools.”406 With the international focus of RBF and an increasing political attention to questions of technological development in the Global South, NAI increasingly focused on ways to apply their technologies to places beyond the United States and Canada. McLarney’s work in Costa Rica demonstrates this trend most effectively.407

The success of RBF funding lay with Michaela Walsh, whose personal interests centered on supporting women’s economic independence and in women’s issues in general.408 Indeed, while the official RBF minutes do not mention women, for Walsh women’s participation in NAI was essential to her support of the group. After praising “the genuinely gentle and humane attitudes and relationships which appear to prevail among the members,” she wrote that “there can be no doubt that one of the major reasons for the successful communication of this group lies in the fact that John Todd and Nancy Todd are an exceptional couple. Individually, they represent strong personalities and they share a leadership role which creates an equal balance between masculine and feminine elements of the Institute and its members.”409 One of the promises of NAI’s domestic technoscience practices, for Walsh, and therefore essential to NAI’s gaining funding from RBF, was that it provided women with professional and social power. This promise, though, was counterbalanced by the need for NAI to prove their work in mainstream scientific networks.

406 Executive Committee minutes, November 22, 1974, Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC.
407 Bill McLarney developed a branch of NAI in the early 1970s. The Journals include reports on his work. This would be an excellent place for further research to show the connections between AT groups in the Global North and their participation in development projects in the South.
408 Walsh traveled to the World Conference on Women held in Mexico City in 1975. There, with women from around the world, she founded Women World Banking, a non-profit centered on providing support for women looking for financial access. Walsh, interview.
409 Michaela Walsh to RBF Files, July 24, 1975, Box 706, Folder 4225, RBF FA 005 RG3 Series 1, RAC.
The funding from RBF meant that NAI could continue their work. However, such funding came with increased demands for the Institute to prove its scientific acumen within conventional scientific circles. Walsh supported NAI’s social goals, but from the outset Fund officers insisted that the Institute take a more rigorous scientific approach. The key to finding new financial support lay in the New Alchemists promoting their work as legitimate science. As Gerald Barney, an RBF scientist, told Todd, “it is very important that NAI continue its efforts to broaden its base of support …all foundations, including the RBF, have experienced a significant decline in both the value of their portfolios and what the remaining value can buy.”  

Barney insisted that Todd list “all NAI publications in professional journals (so that non-scientific foundation people have some assurance that NAI does ‘science’ in a new, but legitimate, sense).” The crux of these discussions lay in the fact that conducting science beyond accepted institutional spaces and producing technoscientific knowledge through applied methods appeared suspect to mainstream scientists. While technoscientific production for people, rather than profit or academic success, had underlain NAI’s vision from its inception, the desire to make spaces of daily life (homes) also spaces for science began to seem tenuous. Making NAI’s work count as legitimate science became crucial in discussions over their largest project, the Prince Edward Island “Ark.”

While working with RBF, NAI looked to the Canadian government to fund their experimental bioshelters. Canada would be hosting the UN Conference on Human Settlements (Habitat) in 1976 and the federal government had promised funding for several major

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410 Gerald O. Barney to RBF Files via Michaela Walsh, November 11, 1975, Box 706, Folder 4225, RBF FA 005 RG3 Series 1, RAC.
411 Gerald O. Barney to RBF Files via Michaela Walsh, November 11, 1975.
demonstration projects to showcase Canadian innovation in housing and land use. NAI wanted to become one of those demonstration projects. In fact, the Todds had dreamed of a Canadian center for years as they were both Canadian. The Alchemists proposed a “structure and a renewable energy system designed to sustain the food, shelter and power needs of urban or rural families.” The building, designed with SolSearch Architects David Bergmark and Ole Hammarlund, would contain commercial and family greenhouses, aquaculture tanks, windmills and passive solar energy systems, composting toilets, and living space for a family who, ideally, would run the building and eventually make money from the agricultural ecosystem they tended. As they wrote in a description of the project, the Ark would be able to “sustain humans at the household level” as such a scale would be “independent of the many vulnerable components of modern agriculture.” Not only would the Ark provide food, shelter, and energy to families, it would benefit them as citizens as it would “give Canadians confidence in the future” providing “a practical and exciting alternative to food shortages, poor quality foods, limited diets and expensive household heating.” As historian Stephen Mannell argues, this was an “implicit reformulation of the public [emphasis in original], as distinct from governance, as

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412 For Habitat conference, see Scott, Outlaw Territories. For NAI grant, see Canadian Urban Demonstration Program press release, April 15, 1975, Series 5, Subseries 2, The Ark Project, Box 12, News clippings, Institute of Man and Resources (91-009), Public Archives and Records Office of Prince Edward Island (hereafter IMR).

413 As early as 1970 Todd wrote of a planned Maritimes location for the Institute, and in 1973 he wrote to Brand that “I am drawn to Cape Breton in a very private way. Last night I dreamt of a Breton Valley with steep hills. Everything was extremely still and covered with deep snow. I was standing in silence, looking north and not wanting to change anything. What was important was capturing the place with its cold stillness.” Todd to Brand, August 9, 1973, Box 7, Folder 3, SBP. When RBF was finalizing its first grant to NAI, the Todds were on PEI. See Tyrone Cashman to Michaela Walsh, September 27, 1974, Box 706, Folder 4223, RBF FA005 RG3 Series 1, RAC.


415 Mannell, Living Lightly on the Earth, Chapter 1.


the site for technological innovation and social progress, [and] is perhaps the strongest legacy of this compelling architectural event.\textsuperscript{419}

By April of 1975 they had secured $354,000 from the federal government to design and build an “Ark” on Prince Edward Island. The PEI provincial government provided land on Spry Point.\textsuperscript{420} Officers at RBF took credit for enabling NAI to receive the grant from the Canadian federal government. As one wrote, “the Fund’s $50,000 grant to this small research community in November 1974 appears to have been a particularly significant one since it has helped trigger considerable interest and publicity in the Institute’s work. The Canadian government has selected the New Alchemists … to develop a new research and education center.”\textsuperscript{421} Along with RBF, personal connections likely facilitated the Institute’s grant from the Canadian government. Mannell describes a complex string of meetings and introductions that led to the New Alchemists gaining support from PEI’s Premier, Alex Campbell, and Andrew Wells, his chief strategist.\textsuperscript{422} By the end of 1975, Todd was able to tell Brand in a letter that he was “long-time friends” with Campbell and Wells.\textsuperscript{423}

The “Ark,” even before its completion, invoked intense praise and criticism. Whether approving or not, the public discussion surrounding the ecological architectural experiment rested on the relationship between science and home. In the press, the potential for technoscientific citizenship NAI saw embodied by the Ark was undermined by feminine

\textsuperscript{419} Mannell, \textit{Living Lightly on the Earth}, 9.
\textsuperscript{420} The CUDP funding was canceled as of July 1975, and funding for the Ark moved to Environment Canada. Mannell, \textit{Living Lightly on the Earth}, 63.
\textsuperscript{421} William L. Dietel to Rockefeller Brothers Fund Trustees, February 27, 1975, Box 706, Folder 4224, RBF FA005 RG3 Series 1, RAC.
\textsuperscript{422} Mannell, \textit{Living Lightly on the Earth}, 45. McEachern puts far less weight on personal relationships and chance meetings. However, these seem to be crucial to the funding winding its way to NAI. McEachern is more concerned with the negative reactions from Islanders and the press regarding the “Ark” as a waste of money. MacEachern, \textit{The Institute of Man and Resources}.
\textsuperscript{423} Todd to Brand, December 18, 1975, Box 3, Folder 6, WER. However, he spelled Alex Campbell as “Cambell”.

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ecological domesticity. NAI envisioned bringing science into homes as a form of social change. Instead, as the story of the Ark demonstrates, women were yet again denied access to technoscientific citizenship and encouraged to care for the earth through care for the home.

“Space Age Ark, Brave New Home”: Gendered Discourses of the PEI Ark

From the outset, New Alchemists intended the Ark as both a home and a place of scientific research, something historians have failed to dwell on. Developed for the U.N. Habitat conference, it was conceived as a family home. As the Canadian magazine Maclean’s noted, “the government-funded solar house was meant to provide self-sufficiency to a family of four: food from organic gardens, fish from culture tanks, electricity from the wind, warm air and hot water from the sun. No pesticides, no pollution. A fresh start for an exhausted planet.” The Ark was also supposed to be a research institute, a place to “to study the application of solar, wind, greenhouse and aquaculture technology.” The proposed building contained aquaculture tanks, greenhouses, solar arrays, windmills, and a living space. Whoever lived in the Ark would manage its internal ecosystem by tracking thermodynamic flows, nutrient cycling, other ecosystem dynamics. Creating a mini-ecosystem and then studying ecosystem dynamics was not conventional ecology, which looked to places outside homes for its evidence. People loved the idea of an ecological home, arriving in such droves it became almost impossible to live and work in the building. An ecological home, however, also provided fertile ground for critiques of the Ark’s scientific research. Indeed, questions swirled about the scientific potential of the Ark from its inception. “If ‘evidence’ is quantitative papers in the literature, then our critic is right,” wrote

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424 Silver Donald Cameron, “The Foundering of the Ark,” MacLean’s (1981): 13. The lack of attention to property and land ownership by AT is glaring when contrasting this article to another story in this same issue of Maclean’s dealing with First Nation land claims.
Todd regarding a confidential review of the Ark. Home and science might not be as easily merged as the New Alchemists wished.

Figure 15. Nancy Willis at home in the PEI Ark. “A Most Prudent Ark,” Fisheries and Environment Canada, 1977.

NAI wanted to blend scientific research with domestic spaces so that all people could take control of their ecological relationships. This held the potential to overturn power hierarchies they believed emerged from control of knowledge production. However, much like in other accounts of NAI’s work, the scientist conducting research in the Ark was decidedly male.
One article noted that “with his wife and three children, Dr. Todd will live in the ark on a rotation basis with other New Alchemy personnel and their families.”426 This scientific masculinity was joined with feminine ecological domesticity. Thus, the radical potential of ecological living was undercut by a turn to conventional gender norms. Home and science could not be combined because science was a man’s domain, and the domestic was women’s concern.

Descriptions of feminine ecological domesticity filled popular accounts of the Ark, depicting women’s care for the earth through labor in the home.427 If the family home became a “sanctuary” from the Cold War, it also became a sanctuary from ecological crises.428 Articles depict Nancy Willis, a horticulturalist who moved into the Ark with her then-partner, David Bergmark, and her two children from a previous marriage, as a carefree domestic woman, one whose lifestyle allowed her time to lie down for a tan while tending the Ark’s garden beds, and as a purveyor of “bikini diplomacy” through her practice of shoveling compost in her swimsuit.429 “Her” kitchen stood above the “family-sized” greenhouse; she put children to bed while making a “a quick inventory [before a storm]: solar panels, water storage, fish ponds, greenhouse temperature and glazing, windmill, Clivus system.”430 An article by Constance Mungall in Chatelaine, a women’s magazine, assured readers that that the New Alchemist’s PEI Ark had “a washer and a dryer, an electric stove in the kitchen, a refrigerator and all the usual

426 “PEI chosen for ecological ark plan to perfect self-sufficient living unit,” Globe and Mail, July 9, 1975, p. 4, 1975, Series 5, Subseries 2, The Ark Project, Box 12, News clippings, IMR.
427 Felicity Scott offers an insightful analysis of the ways various “outlaw territories” successfully replaced politics with technique, providing the means to expand state control over environments and continuing social inequities. I want to expand her argument to suggest that regimes of governance for the good of the “environment” take place in the domestic realm as well. Scott, Outlaw Territories. Noël Sturgeon also argues that feminizing nature means women do “the (house)work of cleaning up environmental damage.” In ecological domesticity, women literally enact domestic labor to save the planet. Sturgeon, Environmentalism in Popular Culture, 42.
428 As Tarah Brookfield argues regarding Cold War domesticity, “Women’s caregiving was positioned as a matter of national security.” Brookfield, Cold War Comforts, 53.
small appliances: vacuum cleaner, iron, hair dryer, TV, radio and record player, and of course power tools." Mungall told readers that

The house itself is more efficient than most, and Nancy [Willis] has not fewer labor-saving devices. Without her commercial greenhouse chores, and her role of hostess to scientists, politicians and the public who visit the Ark, Nancy says the living quarters would take no more housework than a normal bungalow. With the 1,900-foot-square greenhouse and the 30 fish tanks producing cash crops, it would be a full-time job -- but one many women would enjoy -- at home with the kids but producing and earning. The self-composting Clivus system is easier than operating a compost pile of kitchen wastes, as many conservation-conscious housewives do these days.

The Canadian government publication, *A Most Prudent Ark: Living Lightly on the Earth*, highlighted scenes of the Ark’s kitchen, including a group gathered for a meal and Willis leaning over a child in a kitchen, as well as Willis handing a ripe tomato to a child of color (*Figures 15, 16, 17*). According to Mannell, “the heart of the Ark’s family life was a big farmhouse table in the kitchen-dining area,” and the “connection of kitchen and table to food production remains the most compelling poetic vision of the Ark.”

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433 *A Most Prudent Ark*, (Canada: Fisheries and Environment, 1977).

Representations of the Ark as a familiar domestic space suggested to readers that inviting nature into homes would not require overturning conventional white, middle-class social roles. When some visitors became “outrageously angry”\footnote{Lees, “Aboard the Good Ship Ark,” 51.} at the sight of things like dishwashers as they did not correspond with a conservation lifestyle, the Alchemists replied “Do you think we could get the average housewife to cook on a wood stove?”\footnote{Lees, “Aboard the Good Ship Ark,” 51.} The public depiction of the Ark was not, in fact, separate from the Alchemists’ goals. They wanted, as Kate Eldred noted in an interview, to make ecological living accessible even to those people who identified as middle-class and mainstream. As she recalled,

\begin{quote}
We realized that if you were going to change society … women were the audience to reach. And that was part of [our] emphasis on homely, domestic, middle class changes people could make. We didn’t really expect most women to be interested
\end{quote}
in rushing out and you know doing vermiculture and you know building a solar greenhouse. But we certainly expected women to be very interested in gardens and living clean, and consuming less, and keeping houses warm as easily as possible, all of those things.\textsuperscript{437} The implication was that living with nature, caring for the earth, could be accomplished by any woman.

Figure 17. Nancy Willis hands a child a tomato. “A Most Prudent Ark,” Fisheries and Environment Canada, 1977.

While the articles assured readers of Willis’ mainstream persona, Willis could not have been considered a conventional, middle-class woman. She had lived a bohemian and hippie life. She stopped college to travel for years in Europe, married a man who was part of a \textit{avant garde} theater group in New York, marched in Boston for prison reform, and introduced her then-partner, David Bergmark, to the New Alchemists.\textsuperscript{438} Her passion was social and political change, not traditional social values.

\textsuperscript{437} Eldred, interview.
\textsuperscript{438} Willis, interview.
In fact, Michaela Walsh at the RBF celebrated Willis precisely because she was not a humdrum housewife. During the building of the Ark, Walsh had continued to be a close supporter of NAI, showing up, as did many other acquaintances, to put finishing touches on the biohelter in time for its opening. Jack Todd recalled working with her through the night to finish a wooden floor.439 A year later, Walsh traveled to Ottawa on her way to the Ark, arguing in a memo that all of the complaints – such as the Ark being closed to visitors, being unkempt, and having an “absentee” landlord – were “superficial for the most part.”440 Praise for Willis, in fact, flowed from Walsh’s typewriter: “Nancy Willis is quite a remarkable woman,” she wrote, “brilliant in her articulation of the engineering design feats and the varied and extended growing seasons within the ARK. She is also keeping data on the types of food that can be grown year-round.” “I think her articulation of the work of the New Alchemy,” Walsh added, “is one of the more exciting discoveries within the group to date for me: as a woman, as a horticulturalist, and as someone who has experienced and grown over the past year.” Because of this, she urged the Todds to allow Willis to stand as a spokesperson to granting agencies “outside the strictly scientific community.” Willis, however, had her faults: she was “anything but a tidy housekeeper.”441 Although the architectural historian Stephen Mannell suggests that the housekeeping was solved by Willis’ partner, David Bergmark, pitching in, this was not the case.442 With encouragement from Walsh, the New Alchemists hired a local woman to take “charge of keeping the place spotless.”443

439 Todd, A Safe and Sustainable World, 109. Todd remembered they wanted the Ark to be “more homey than ‘house beautiful (102).’“
440 Walsh to RBF Files, December 5, 1977, Box 707, Folder 4228, RBF FA 005 RG3 Series 1, RAC.
441 Walsh to RBF Files, December 5, 1977.
442 Mannell, Living Lightly on the Earth, 73.
443 Walsh to RBF Files, December 5, 1977.
Ironically, the symbol of home that provided avenues for promoting the Ark came to be the central concern only six months after Willis and others moved into the building. One director emphasized that the publicity had made it impossible for “the inhabitants of the Ark to have any private life at all.” He went on to cite a failed wind project and “the inclusion of normal domestic electrical appliances” as the reasons the project lacked credibility. His solution? A more “scientific manner” led by professionals, scientists, and practitioners in research and design.\textsuperscript{444}

Similarly, in a technical review in 1979, nearly all of the reviewers mentioned that it had been a mistake to represent the Ark as a family dwelling – primarily because the focus on “home” or “family” may have obscured the fact that the Ark was, first and foremost, a research institution.\textsuperscript{445} As one wrote, “The real message in the Ark can be distorted by the symbol of the family home, and the concept of self-sufficiency. The Ark is researching the concept and demonstrating the potential for self-sufficiency, and doing so effectively, but it quite clearly is not self-sufficient in food or energy.”\textsuperscript{446} Instead, he suggested the Ark represented a mode of international development: “The Ark can be a focus through which Canada’s commitment to ecodevelopment applied to third-world assistance can be strengthened, and equally can be a facility through which to translate experience from ancient cultures to help Canada search out a path to greater stability.”\textsuperscript{447} To others, the Ark represented a space that highlighted long-standing Canadian values of self-sufficiency and food-production on a family scale; the possibility of exporting such technologies to developing nations; or the impossibility of an actual family managing to have enough money to maintain such a home. The Ark, that is, wanted to be everything, most potently a research laboratory and living space, and so, in the end, crossed too

\textsuperscript{444} David Catmur to Nancy Willis, July 4, 1977, Series 5, SS2, The Ark Project, Folder 2, Correspondence, IMR.

\textsuperscript{445} Technical Review Meeting, “Ark for Prince Edward Island,” 1979, NAI-UPEI.

\textsuperscript{446} Technical Review, 5.

\textsuperscript{447} Technical Review, 7.
many boundaries to be understood as anything concrete. In the words of one reviewer, “the Ark may be overwhelmed by expectations disproportionate to its own capacity to produce, not fish, vegetables and so forth, but ideas and images.”

“NAI Must Become Economically Viable”

The New Alchemists in Falmouth had largely disassociated from the PEI experiments by March of 1978. While the PEI Ark faced increasing economic difficulties, the Falmouth center continued to receive grant funding and media recognition. In fact, a year earlier NAI had received a grant from the National Science Foundation to support its work modeling Ark system dynamics and hire a systems ecologist to join NAI full time. RBF also continued funding NAI, granting $75,000 to be payable over three years, from 1977 to 1979. NAI and similar organizations were the beneficiaries of the Fund’s focus on groups that imagined technological and cultural alternatives. Yet support was on the wane even before Ronald Reagan’s election in 1980. The “fall” of appropriate technology, as the historian Carroll Pursell calls it, began in the late 1970s in an atmosphere of increasing fiscal crises and continued economic uncertainty.

Despite NSF, RBF, and Noyes Foundation funding, NAI walked close to financial insolvency by the late 1970s. In 1978, they didn’t have money to reprint journals or meet payroll in some months. Not only were they struggling to meet basic organizational expenses, they also faced something their ecological technologies could not provide an answer to: the threat of a

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450 Walsh to RBF files via William M. Dietel, June 28, 1977, Box 707, Folder 4228, RBF FA 005 RG3 Series 1, RAC.
451 Walsh to Todd, February 16, 1977, Box 707, Folder 4227, RBF FA 005 RG3 Series 1, RAC.
452 This is despite the fact of another oil crisis in 1979. The question of why one such crisis spurred support of alternative technologies and the other did not is worth pursuing. It may lay in the shifting political rhetoric surrounding global energy markets marked by Reagan’s upcoming election. Pursell, “The Rise and Fall.”
453 “Finances,” *New Alchemy Institute Newsletter* (June 1978): 3, Box 33, Folder 6, NAI-ISU.
housing development surrounding their farm and their landlord selling the land that they had
cultivated for close to a decade. They proposed to their members that they wanted to create a
land trust, to which they would pay an annual rent of $9,000. But they did not have anywhere near
the $250,000 needed for a down payment. “Anyone interested in participating in a land
conservation trust,” they suggested to their readers, “- or better yet – becoming our landlord
should get in touch with us as soon as possible.”454 A year later, in fall 1979, the Alchemists had
found a new landlord – Maurice Strong, a Canadian who had led Petro-Canada and worked for
the United Nations Conference on the Human Environment. He visited the farm and agreed to
buy it, contingent on their beginning an account for the purchase of the land.455

Indeed, the Alchemists’ land struggles were just the tip of their financial and
organizational worries amidst the rapidly shifting economic and political landscape of the late
1970s. While RBF had granted funding, they also initiated a review of the Alchemists’ work to
ask several questions about the organization: Was their science being done efficiently? Should
the RBF continue its support? Additionally, a review would be good for “nurturing the
organization” at a time of change.456

The reviewers answered these questions largely in the affirmative. But several issues
continued to plague NAI that had been with them for years. First and foremost, their acceptance
by the scientific community at large. One scientist interviewed suggested that “they extrapolate
too freely,” while another admitted that “the scientific community in general does not take NAI
seriously, and that this is a serious charge, an issue that NAI must deal with if it is to be
effective.” Margaret Mead, an anthropologist, rejected these critiques and argued for NAI’s

454 “The Great Land Ordeal,” New Alchemy Institute Newsletter (Spring 1978): np, Box 33, Folder 6, NAI-ISU.
455 “New Alchemy’s Land Saga,” New Alchemy Institute Newsletter (June/September 1979):np, Box 33, Folder 6,
NAI-ISU.
456 Barney and Walsh to Yorke Allen, November 1, 1976, Box 707, Folder 4231, RBF FA005 RG3 Series 1, RAC.
applied science, saying that “Hard scientists are hopeless. They can deal with only one dependent variable at a time. They don’t understand Todd.” The need to prove themselves a scientific research organization clashed, as it had with the PEI Ark, with their insistence that they were building model housing for the future. Indeed, the other question the reviewers had was who, exactly, could benefit from the Ark concept. The reviewers argued that it needed to be shown to be possible in “a concentrated urban population.” “If continuing RBG support is to be justified,” the report insisted, “NAI must become economically viable … NAI will need assistance to bring costs down … The relationship of Ark costs to ordinary home costs must be determined.”

For the reviewers, NAI existed at the nexus of science, home economics, and the agricultural possibilities of Ark food production. None of it would be possible, however, without “economic viability.”

The question of economic viability came to dominate the Alchemists internal discussions as well. For John Todd, “another damn modest proposal” was essential, this time to insist that “ecological economies” were necessary to weather “the world mass economy … stagger[ing] from one cracked pillar to crumbling edifice and perhaps collapse in the 1980’s.”

Todd suggested to fellow “Alkie Farmers” that “The central question will begin to revolve around the possibility of ecological economies which by definition create work, health and modest wealth.

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457 Barbara and David Hertz, “Evaluating the New Alchemy Institute – Holistic Research and Development Approaches to Alternative Technologies,” March 31, 1978, Box 707, Folder 4231, RBF FA 005 RG3 Series 1, RAC.

458 This is what RBF made grants for in the late 1970s. If their first grants were for innovation -- “developing new technologies for utilizing solar energy in the production of high-nutrition yield food on a minimum amount of space (Rockefeller Brothers Fund Annual Review 1974),” their later grants went to budgetary support and for “support of a study of the economic viability of the institute’s agricultural bioshelters (Rockefeller Brothers Fund Annual Review 1979).”

459 Todd to “Alkie Farmers, Another Damn Modest Proposal,” November 20, 1980, Box 38, Folder 12, NAI-ISU.
without despoiling or destroying … In the 1980’s we need to ask ‘If ecology can provide the basis for human economics particularly in agriculture?’

Prodded by outward economic pressures, NSF funding that allowed them to hire individuals at rates beyond the equal pay structure, and the decision of John and Nancy Jack Todd to move on from the Institute, NAI began a process of re-structuring. To become more economically and organizationally efficient, they initiated increased divisions within the organization. They also turned increasingly toward education, communication, and consulting.

Members critiqued these organizational shifts. Bill McLarney wrote to the group of his dream that “never quite made it,” the “‘perfect marriage’ of science, technology, humanities, arts, etc. For instance, without having any clear idea of how it was to come about, I happily anticipated the day when New Alchemy would have artists on staff, doing their thing -- primarily -- and also pulling weeds. Never really happened.”

Or as another put it, “What is a New Alchemist? To me, a New Alchemist is someone who believes in the dream of an ecologically sound, self-empowered, decentralized future … someone who is a part of a synergetic community and sees the value of cooperation. We’re losing some of these facets as we move apart into a free-enterprise system.”

In particular, the women at New Alchemy took matters of organizational structure and economic equality as key components of their work. When the equal pay structure dissolved in the late 1970s, one warned that “we will be a hierarchical institute of professional males with a

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461 “What NAI Means,” Box 38, Folder 12, NAI-ISU. RBF Board of Trustees Agenda, December 2, 1981, Box 709, Folder 4236, RBF RG3 Series 1 RA 005, RAC.
462 McLarney to Alchemists, “What NAI Means,” Box 38, Folder 12, NAI-ISU.
463 Merryl, October 11, 1981, “What NAI Means,” Box 38, Folder 12, NAI-ISU.
few lower-salary support females, and I’m not normally given to heavy feminist statements."

More bitingly, another equated the changing organizational structure to the ways “the mechanization of agriculture in the nineteenth century was done on the backs of women and blacks and migrant wage laborers” suggesting that “New Alchemy … could follow in the same model.”

Despite these internal disagreements, NAI moved further into capitalizing technologies and focusing on technologies rather than social change. In the early 1980s, they worked on developing a model farm and researching “household ecology.” A member survey in 1983 indicated that this focus on practical, “self-sufficient” home and farming research was what their readers wanted. Most members were interested in the “how-to” approach of the organization, most were in their late 30s, and most had college degrees. They were primarily not involved in other political organizations but in “environment/conservation” work. They were drawn to the “practical research approach [and that it was] not ‘cosmic/complicated.’” The financial landscape of the 1980s was responsible for this change, but it also fit with the vision of personal autonomy through technoscientific control that the Alchemists had promoted for over a decade.

Conclusions

At the beginning of the 1970s, NAI had formed as an AT group intent on overturning social norms through technological change. They, like other AT groups, embraced forms of technoscientific citizenship in which all people could become independent producers of food, energy, and shelter. Their view of who could enact technoscientific citizenship included all

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464 “To everybody from Susan [Ervin],” “What NAI Means,” Box 38, Folder 12, NAI-ISU.
465 Christina Rawley to “In response to John T’s NOTES TO ALKIES and THE NEW FARM,” nd, Box 37, Folder 12, NAI-ISU.
466 Barnhart, “What is the Use of a House if You Haven’t Got a Tolerable Planet to Put it On?,” New Alchemy Quarterly (Winter 1986): 3, Box 8, Folder 1, NAI-ISU.
467 Survey results, Box 709, Folder 4238, RBF RG3 Series 1 FA 005, RAC.
people and all genders; as Maingay remembered “It didn’t matter if you were young, old, female, male.” In their view, all people should have access to the power they believed lay in the ability to create technoscientific knowledge. In their work, they wanted to produce scientific knowledge in homes, overturning the spatial structures that kept science the purview of academic practitioners. In doing so, they imagined people would learn how to care for the earth through care for their own “world in miniature.”

However, as NAI’s work became known to a wider public, and as they gained funding from foundations and governments, their radical vision for ecological domesticity and technoscientific citizenship diminished. In descriptions of their work, technoscientific citizenship again became a male preserve while women were expected to assume ecological domesticity as the way to care for the earth. Steven Mannell suggests that this ecological domesticity could have been the grounds for a more liberating form of feminism. “By the 1980s, consumerism would co-opt feminism in a very different solution to the isolation of the suburban housewife,” writes Mannell, “holding down a second job in a two-income family, with an accompanying explosion of consumerism. From a present-day perspective, the Ark life seems a more fully liberating route for both families and the planet.”

In suggesting that care for the Ark could provide women’s independence, Mannell avoids grappling with the ways this may have only added to the care work women undertake. The view that one can care for the earth, enter capitalist production, and maintain the reproduction of social life – “at home with the kids but producing and earning” – returns women to the private sphere of the home and its unpaid labor. Additionally, such ecological domesticity places the burden on individuals rather than on changing the economic

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469 Murphy, “Unsettling Care.”
and political structures at the root of ecological crises, a form of depoliticization.\textsuperscript{470} In ecological domesticity as represented by the Ark, the border-crossing of ecology into the domestic realm increased women’s care work and reinforced gendered limitations on participation in collective life.

New Alchemy, an organization that thrived on the utopianism of the early 1970s, full of the promise of personal and community change, was hit hard by the rise of Reagan and the defunding of programs that accompanied his presidency.\textsuperscript{471} The personal autonomy, self-sufficiency, economic independence, and the political participation they imagined in the 1970s would be turned, in the era of neoliberalism and privatization, into a sense of personal responsibility and self-governance in the face of economic restructuring; a turn towards neoliberal personalization of what were, in fact, public problems that required political solutions.\textsuperscript{472}

This chapter has detailed the way one AT group moved from counter-conduct into mainstream practice. The next chapter turns to the ways government programs aided ATs movement into public life. It does so by looking specifically at Canada’s “conserver society,” a program developed by the Science Council of Canada to turn Canadian citizens from consumers into “conservers” of energy and resources.

\textsuperscript{470} Macgregor, “Only Resist,” 624.

\textsuperscript{471} As the Rockefeller Brothers Fund noted in their funding of NAI in 1981, “NAI has received substantial support from a number of federal agencies, which is now being eliminated.” RBF Board of Trustees Agenda, December 2, 1981, Box 709, Folder 4236, RBF RG3 Series 1 RA 005, RAC.

\textsuperscript{472} See Kimura for the neoliberal citizen’s acceptance of personal responsibility for risk. Kimura, \textit{Radiation Brain Moms}. David Harvey writes that neoliberalism is “a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade.” David Harvey, \textit{A Brief History of Neoliberalism} (Oxford: Oxford University Press, 2007), 2.
CHAPTER 6

“WASTE: THE NEW PORNOGRAPHY”: CITIZENSHIP AND GENDER IN CANADA’S CONSERVER SOCIETY

When Ursula Franklin, physicist and member of the Science Council of Canada, described the “conserver society” to journalists, she suggested that reducing Canadian resource use rested on both personal choice and governmental action. “I, we, are groping for some kind of solution which would make it government’s role to set boundary limits within which people could be truly free,” 473 Franklin noted, pointing to government’s role in equitable management of resources. Or, as Franklin told another reporter, “You begin with a set of attitudes that I define as Thrifty Housewife, then you start asking yourself, what, exactly, are you saving the energy for?” 474

In these statements, Franklin drew attention to two central concerns of the conserver society: government regulation and individual responsibility. The conserver society was a project initiated by the Science Council of Canada (SCC) that resonated throughout Canadian political and cultural life. When the SCC published Canada as a Conserver Society in 1977, it aimed to turn Canadians from “consumers” to “conservers.” While historians have grappled with the ways the conserver society related to a rise in technocratic governance, connections between science policy and free-market economics, and federal support of local environmental movements, they have not yet looked at how the notion of a conserver society was at heart a debate about citizenship. 475 As explained by Franklin, the conserver society required government action to

“set boundary limits” on corporate control, while also suggesting the political nature of resource conservation: the question of “what are you saving energy for?” had to be answered by all people. Finding a way between government control and individual freedom to limit consumption marked debates over the conserver society.

The conserver society emerged in response to the same concerns that underlay work by AT activists: the economic and ecological limits to growth. AT responded by arguing for personal independence in the production of food, energy, and shelter, which they saw as providing the base for participatory politics. This form of technoscientific citizenship highlighted self-sufficiency as a way to curb the destructive technologies of high modernism.

Conservation of energy and resources, rather than changing the means of their production, provided another solution to the economic-ecological problem of a limited earth. In post-war thought, consumption provided an ever-growing economy and ensured political equality, what historian Lizabeth Cohen calls the “Consumers’ Republic.”

To propose conservation as the basis for citizenship upended this long-standing political consensus. Franklin and others who constructed the conserver society asked: What would a politics of conservation, rather than consumption, look like? Could democracies survive a shift to a steady-state economy? What else could be done with money going to militarization and industrialization? And who should be responsible for citizens’ shifting relationship to economies and ecologies?

This chapter looks at the conserver society through the lens of citizenship. It does so by contextualizing the SCC report through Franklin’s activism. Franklin intended the conserver

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society to construct a form of citizenship that did not place the responsibility for resource protection on individual action but rather government regulation. Throughout her work, she continually wanted to know who benefitted and who bore the cost of government policies regarding energy production and resource use. For Franklin, technoscientific citizenship required state regulation of corporate ownership, as foreign corporate control of energy undermined a state’s sovereign rights to protect its citizens as well as citizens’ ability to make demands of government.477 The conserver society, seen as an argument for government regulation that would ensure citizens’ political power, may be seen as an attempt to promote liberal state control at a moment of market ascendency.478

A focus on citizenship also highlights the fact that there was no universal conserving citizen; indeed, Franklin’s comment that a “Thrifty Housewife” attitude could conserve resources indicates the gendered essence of conserving citizenship. While Franklin argued for a form of technoscientific citizenship that required government responsibility, the conserver society gained public meaning through publications that reinstated a specifically gendered ecological domesticity, in which women bore the responsibility to be conserving citizens in their homes. While the images of an ideal conserver may have relegated women to the private sphere, at the same time women saw the conserver society as a framework that allowed them to question the relationship between environmentalism and feminism. Women who wrote about the impact of the conserver society on women rejected ecological domesticity, speaking against women’s

477 For examples of the repercussions of foreign ownership, see Rob Nixon, Slow Violence and the Environmentalism of the Poor (Cambridge: Harvard University Press, 2011); Mitchell, Carbon Democracy. Franklin represents someone who connected planetary ecology to questions of decolonization and national economic power. That is, she saw economic globalization as crucial to environmental devastation and undermining political rights. Rob Nixon does an excellent job with balancing postcolonial literature with a view of planetary ecology.
478 Frieden, Global Capitalism; Ferguson et al., The Shock of the Global: The 1970s in Perspective.
continued absorption into natural rhythms – forever caught either consuming the world or maintaining it – and instead turned towards structural analysis and political action.

“We May Make People Homeless”: The Voice of Women’s Technoscientific Citizenship

A decade after the Voice of Women (VOW) argued that the Canadian government needed to take responsibility in informing its citizens about the effects of radioactive fallout (see Chapter 1), they had expanded their activism to include anti-war protests and arguments for the protection of the environment.479 Their focus on environmental destruction rested squarely on questions of political power, asking “What is the purpose of government? Why do we elect and pay them?”480 For VOW, the question of who government policies helped was of utmost importance. VOW argued for the rights of citizens to determine decisions over natural resource development, affirming Hannah Arendt’s contention that scientific and technological decisions were “political question[s] of the first order.” Following dominant political conversations at the time, energy was central to VOW technoscientific politics. The energy flowing into the United States from polluted Canadian landscapes as well as government support of corporate profits were indicative of governance that worked against all Canadians for the success of a few.481

479 VOW Vietnam work is well researched, as it is a continuation of their anti-militarist, maternalist stance. For instance, see Frazier, Women’s Antimilitarist Diplomacy During the Vietnam War Era. Their environmental activism is covered less by scholars. Joanna Dean is one exception. Dean, “A Gendered Sense of Nature.” Environment was crucial to VOW, for as Kay Macpherson pointed out in her memoir, “People sometimes ask why a peace group tackles such varying issues as threats to the environment and nuclear power, but as a 1982 VOW statement points out, ‘the nuclear age has changed the nature of war, and a nuclear war could result in the destruction of all life on this planet.’ Survival, as Helen Caldicott says, ‘is the ultimate conservation issue.’ Greed, misuse of power, and domination are at the root of the world’s problems.” Macpherson, When in Doubt, Do Both, 137-138.

480 Franklin, “Notes for the Federal Election, July 1974, for use of Voice of Women members,” Box 39, Folder 12, B1996-0004, UMFF-UTA.

Questions of energy – where it came from, where it went, who benefited, and who suffered economically – stood at the center of national political debates. And the Canadian landscape, as an abundant source of fossil fuels, minerals such as uranium, and as a space through which those fuels had to travel, became a key site of concern for such debates. The debates over energy supplies and foreign investment took on renewed importance after the discovery of Prudhoe Bay oil in 1968 and the resulting rush to find ways of bringing Alaskan oil to the lower United States. Pipeline controversies merged the debates over local development and energy exports; as the historian Paul Sabin contends, the Dene, Metis, and colonial white residents of Northern Canada wanted to control local economic development in the face of possible oil pipelines. The same held true for contentious hydroelectric dam building and proposed nuclear power plants in Atlantic Canada.

The threats to Canadians posed by energy development projects led VOW to articulate an alternative ideology of development, one that emphasized protection of citizens over corporate profits. Ursula Franklin gave voice to this view at a speech to the Ontario Voice of Women in 1970. In it, she argued that rather than profit, development for life, “the gain in human community, rather than in gross national product,” should be central to national energy policies. She insisted that changes to landscapes were not easily undone, that “the pipelines will be built,


482 Canada continues to this day to be both major consumer and exporter of energy, a rare occurrence in industrialized nations. Sandwell, “An Introduction to Canada’s Energy History,” 15. Henry Trim points to economic nationalism as key factor in SCC work. Trim, “Planning the Future,” 385-87.

the hydro projects will be started, the rivers will be diverted,” and that if such decisions were left to commercial interests, rather than to the people of the country, “we may make people homeless – literally homeless– both physically and emotionally.”

Unlike AT enthusiasts, VOW argued that citizens’ participation in technoscientific decisions had to be ensured by government action, not just individual self-reliance. Without political power for all, government policies would continue to devastate the environment and harm Canadian citizens. For as the VOW wrote in another press statement, “We realize that individuals can do a great deal to focus attention on pollution and uncontrolled exploitation. However, the volume and extent of pollution by individuals cannot compare with that of industry and governments, and it is these – the multi-national corporations and governments who manufacture war materials and threaten or make war – whom we hold as the major polluters of our world.”

For these activists, energy development projects linked the rights of Canadian citizens to citizens of other nations. Franklin suggested that there should be “no building of big pipelines, no permission to muck around with the Arctic environment, to build roads, tracks, no dislocating of people and their communities – until we know much better what we are risking and what we are gaining in terms of human and lasting values, we have no right to commit, or let our government commit the wealth of our country in an international poker game.” Franklin understood that asserting Canadian independence might aid Latin American nations looking to

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484 Ursula Franklin, speech to Annual Meeting of the Ontario Voice of Women, May 9, 1970, Box 39, Folder 1, B1996-0004, UMFF-UTA. Of course, many Dene and other First Nations peoples had been made quite literally homeless through territorial incursions and the boarding school programs of the 1950s and beyond. This was at the same time as the Amchitka Island Greenpeace mission. For the relationship between VOW and environmentalism, see Dean, “A Gendered Sense of Nature.”

485 VOW statement on natural resources, nd, Box 37, Folder 16, B1996-0004, UMFF-UTA.

486 Ursula Franklin, speech to Annual Meeting of the Ontario Voice of Women, May 9, 1970, Box 39, Folder 1, B1996-0004, UMFF-UTA.
build their own sovereign economic power. Canadian refusal to allow US economic imperialism might prove an example for nations south of the US border looking to do the same.487

Yet VOW did not just question the priorities of government or the power of citizens to determine national development objectives. Their critique went further, questioning assumptions of economic growth and energy consumption themselves. As VOW wrote in a brief to parliament in 1974,

our basic appeal is for an end to the assumption that energy needs must increase and must be met. We question the use to which much of this energy is put – particularly when geared to military programmes, and to useless and wasteful activities in civilian life. We question why we should undertake the destruction of vast areas of our environment and the pollution of our land in order to export our energy resources. We also question the present priorities of research and development budgets when safer and cleaner sources of energy could be made available. Public need, not excessive profit should be the criterion for resource development.488

For members of VOW, reducing energy was not an end in itself.489 It became a political question, one in which Canadians should be able to decide how energy was used, what kind of research projects public funds should support, and what environments could be destroyed for the production of energy. Their argument centered on “public need,” that is, the needs of all Canadians.

Franklin carried the VOW vision of government responsibility to all citizens and citizens’ rights to participate technoscientific decisions into her work on the Science Council of Canada. For only a few months after VOW sent its statement on energy to parliament, Franklin became chair of the SCC committee charged with studying the

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487 The 1970s were a critical time for oil infrastructure development, not only because of major oil discoveries in Alaska but also because continental oil production had reached its peak in 1970. Huber, Lifeblood, Chapter 4.
488 VOW statement to members of parliament, September 27, 1974, Box 39, Folder 13, B1996-0004, UMFF-UTA.
489 Timothy Mitchell contends that oil companies relied on a politics of scarcity to maintain corporate profits. In contrast, VOW was not arguing for reduced energy consumption but for choices about how energy was used. The question of distribution, access, and government research are political questions. Mitchell, Carbon Democracy.
possibility of a “conserver society.” Lively debate, not scientific agreement, held the
technocratic governance of the 1970s together; the science that experts such as Franklin
embraced was contextual, dependent on debate, contestation, social justice, and ethical
responsibility.  

“Free Canadians for Action”: The Conserver Society Goals

When Ursula Franklin joined the Science Council of Canada in the early 1970s, she
became a member of a crown corporation that played an integral role in planning Canada’s
future technological and scientific development. As the historian Henry Trim has argued, their
work became increasingly important in the turn to technocratic political control in the 1970s,
particularly in areas of energy production and economic nationalism. The SCC researched
questions of Canada’s future energy resources, population growth, and resource development,
writing reports that made policy recommendations on science and technology in these areas.
Committees were charged with the research and writing of various reports, with the entirety of
the SCC providing feedback and editorial suggestions.

One SCC committee charged with outlining potential paths for Canadian technological
development in the face of limited resources was the conserver society (CS) committee. From its
first meeting in 1975 to the publication of Canada as a Conserver Society: Resource
Uncertainties and the Need for New Technologies (1977), Ursula Franklin served as chair for
this committee. Throughout, she persisted in asking who benefited from technological decisions;

490 As Karen Suurtamm wrote in her description of the Ursula Franklin fonds, Franklin wanted to know “is it
possible to teach and learn about the humane applications of technology - and if not, from where do we expect a
socially responsible science to arise?” Suurtamm, “Preserving Her Voice,” xvi. Amory Lovins, energy expert hired
to make projections of Canada’s energy future, rejected one criticism of his support of soft energy paths with this
remark: “The essence of scientific method, as a social process, is to foster, not suppress or hinder, diversity and
exploration, and to leave unsound ideas to be weeded out by the normal mechanisms of peer criticism and public
for Canada’ by E.R. Stoian,” 20 December 1976, Box 27, Folder 11, B1996-0004, UMFF-UTA.
491 Trim, “Planning the Future.”
what the material, long-term consequences of such decisions were; and who should have a say in any decision that would “lay down the constraints and patterns of the social fabric of our country for years to come.”

The conserver society may best be understood as a framework that presented paths for Canadians to change lifestyles, alter their relation to labor, and move from resource dependence to alternative technologies such as renewable energy. The oft-quoted aim of the conserver society was to help “Canadians as individuals, and their governments, institutions and industries, begin the transition from a consumer society preoccupied with resource exploitation to a conserver society engaged in more constructive endeavors. Ideally, Canada could provide the leadership necessary to work toward more equitable distribution of the benefits of natural resources to all mankind.” It thus had at its core the relationship between resource use and “equitable distribution,” alongside a desire to shift individual lives toward “constructive endeavors.” The Science Council of Canada researched and promoted the CS for about six years, from 1973 when it was first proposed to the final publication of the newsletter Conserver Society Notes 1978 when the AT magazine Alternatives took over the publication. Yet, as historians such as Henry Trim and Mark McLaughlin have shown, the conserver society had longstanding reverberations in Canadian society and beyond.

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492 Ursula Franklin, speech to Annual Meeting of the Ontario Voice of Women, May 9, 1970, Box 39, Folder 1, B1996-0004, UMFF-UTA.
494 Science Council of Canada, Canada as a Conserver Society: Resource Uncertainties and the Need for New Technologies (Ottawa, Ontario: Minister of Supply and Services Canada, September 1977); Trim, “Planning the Future.” However, the edition of CS Notes devoted to women appeared in 1979.
495 McLaughlin argues that the conserver society provided environmental groups a useful term to organize around and thereby gain additional funding. Trim suggests that the conserver society framework was an early example of sustainable development located in the global north, rather than the global south, and points to the intersection with economic nationalism. McLaughlin, “Not an Easy Thing to Implement”; Trim, “Planning the Future.”
In chairing the CS committee, Franklin remained committed to debating the relationship of technological change to political and social life. At its first meeting in March of 1975, the CS committee discussed the fact that changing Canadians from consumers to conservers impacted essentially all parts of public life. They decided to focus CS work on specific case studies and public conversations.\textsuperscript{496} From the outset, the committee did not want to create a document of technocratic expertise on the use of Canadian natural resources. Rather, they framed the conserver society as a source of public innovation, diversity, and social equity. They argued that conservation provided a necessary response to people’s increasing alienation from work and the devastation of the environment. Rather than focus on science, technology, and material resources as separate from human social needs, the committee noted that along with limits to resources, the other changes that framed the need for a conserver society were the recognition of humans as “biological creatures, immersed in vital ecological relationships within the earth’s biosphere,” and the “impact of technology on the human being as a social and economic creature.”\textsuperscript{497}

The committee’s commitment to public conversations led them to find ways of making Canadians a part of this discussion of the nation’s resource future. To do so, they held workshops and gave presentations on the conserver society.\textsuperscript{498} They also published a magazine, \textit{Conserver Society Notes}, that detailed home conservation measures, energy analyses of various technologies, and updates from energy activism around North America. \textit{Conserver Society Notes} reached over 1500 people and generated widespread public discussion.\textsuperscript{499} Their goal was to have the public be actively involved in the process of creating a conserver society.\textsuperscript{500}

\textsuperscript{496} Meeting minutes, March 10, 1975, Box 28, Folder 4, B1996-0004, UMFF-UTA.
\textsuperscript{497} Science Council of Canada, \textit{Canada as a Conserver Society}, 10.
\textsuperscript{498} See UMFF-UTA series 11, subseries 1 for various articles and events.
\textsuperscript{499} Science Council of Canada, \textit{Canada as a Conserver Society}, 15.
\textsuperscript{500} Meeting minutes, March 10, 1975, Box 28, Folder 4, B1996-0004, UMFF-UTA.
The “impact of technology on the human being as a … economic creature” also stood at the center of CS committee discussions. The committee’s working definition of a conserver society included an economic critique. They wanted to stop the “the ever-growing per capita demand for consumer goods” and believed that “the total cost to society” should be included in economic models, not just the “private cost” usually accounted for in classical economics. Internal memos indicate that the committee was acutely aware that questioning the benefits of economic growth meant that they could be categorized as socialist and anti-capitalist. In a working paper, “What the Conserver Society Study is Not About,” they wrote, first, that “It is not a frontal attack on capitalism or the market system. Similarly, it is not a veiled way of promoting socialism or some other form of collective society.” They continued, arguing that the CS did not aim to “slow, stop or reverse the process of economic growth. We are, however, concerned about some of the undesirable social side-effects of making the pursuit of economic growth an end in itself.” They asked: “can we maintain the good kinds of growth without the bad?”

In June of 1976, Franklin published an article on the meaning of the conserver society in the Quebec journal Science Forum that reiterated the committee’s internal discussions related to citizen participation and economic critique. In this article, economy of design, cultural attitudes, diversity and flexibility, and concern for the future stood as guiding CS principles. The article struck a chord between individual responsibility and government accountability. Franklin wrote that the conserver society “must depend ultimately on the beliefs and attitudes of individuals. It is evident that much can be done by individual initiative, by the ethical designer, the concerned industrialist, and by the intelligent consumer” and that it was the government’s responsibility “to

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501 Science Council of Canada, Canada as a Conserver Society, 13-14.
502 “What the Conserver Society Study is Not About, Paper 3,” n.d., Box 52, Folder 9, B2015-0005, UMFF-UTA.
act as wise consumer, to promote and protect the common good, to enact legislation that promotes the efficient use of resources and energy … [to] guide and govern the actions of both corporate and private citizens of Canada.”503 Here again, Franklin’s vision mirrored the politics of VOW, in that government constraint of the “corporate … citizens of Canada” would be central to the CS.

Indeed, for Franklin the question of ownership loomed large in defining a conserver society, much as it did in her VOW activism. “Ownership,” she scrawled on a working paper, next to points related to “government regulation” and “resource use.”504 In their “statement of concern,” the committee directly addressed the ways corporate economic power transcended state boundaries, making them “like government.”505 The committee also called for a change to economic accounting, bringing costs usually not included in measures of efficiency into the equation.

The CS committee finished the final report in September of 1977. In it, citizenship and critiques of growth played a central role in framing policy recommendations. It argued that it was the government’s responsibility to plan for the future, as the future has “no votes.” Government needed “to ensure that future citizens are provided with options -- if necessary a trade-off may have to be made against the demands and perceived needs of present citizens.”506 For the committee, all Canadians needed to be part of the decision-making process “since all citizens of Canada, as consumers of products or as taxpayers, ultimately pay for the activities that are carried out in their name by corporations and governments.”507 Alongside an insistence on

504 Paper 5, Box 52, Folder 9, B2015-0005, UMFF-UTA.
506 Science Council of Canada, Canada as a Conserver Society, 45.
507 Science Council of Canada, Canada as a Conserver Society, 69.
planning for future citizens and the participation of present Canadians, the report noted that growth was also a political, not physical, issue: “There is nothing wrong with such aspirations, nor with the economic growth on which they depend, provided their consequences are understood. The Science Council is concerned, however, with discerning feasible technological paths, and we recognize that it is essential to keep certain questions in mind: (1) Growth of what? (2) At what cost? (3) Within what constraints?”

The conserver society, in short, integrated social concerns with economic and environmental considerations. In celebrating human diversity and creativity, recognizing the failures of Canadian resource use, and placing external costs within economic calculations, the Conserver Society Committee’s report stood apart from others generated by the SCC at the time that took a more conventional approach to Canadian resource management. Other reports embraced continued energy production along with population limits and remained faithful to a scientific expertise above public debate.

Not only in her role as chair of the conserver society, but in her response to these other reports, Franklin remained committed to political debate and ethical science. She had much to say about the political, social, and cultural implications of energy and resource use, as well as the role science could play in policy decisions. Her determination to discuss language and the implications of such reports forced several changes in the final drafts; it also drew to the surface the strong desire of SCC members to erase internal divisions and hide political discussions from the published scientific reports.

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508 Science Council of Canada, Canada as a Conserver Society, 63.
“Democracy Will Lose Ground and Meaning”: The Politics of Writing Technoscientific Reports

In the midst of her own work on the conserver society, Franklin found herself at odds with the rest of the Council on another report her colleagues were preparing at the time. In Population, Technology and Resources, the SCC suggested that Canada had to maintain a steady population and emphasized the need for Canadians to rely on nuclear power and coal in the coming decades. As different SCC members researched and wrote reports, these documents could carry divergent messages, and this was the case with the differences between the Population report and Canada as a Conserver Society. The conserver society report embraced renewable energy rather than nuclear, human creativity and flexibility rather than population limits. These reports presented opposite scenarios for Canada’s energetic and economic future.

Indeed, Franklin saw the Population report solutions as rejections of her own conserver society work. “If the Council truly believes that what we recommend or even study is not going to be implemented in the next twenty-five years,” Franklin wrote to the chair of the population study, “then I might just as well give up. The projection of a hundred nuclear reactors without any genuine consideration of the implications, whether environmental, technical or political, seems to me particularly naive.”

Franklin’s criticisms of Population, Technology and Resources spoke directly to her concerns over ownership, especially questions of land use, nationalist trade policies, and economic equity. According to Franklin, the report skirted the political questions of ownership and land use. Neither of these, she contended, could be dealt with through scientific studies. She

509 In the 1970s, limiting population was a large part of the discourse surrounding conserving limited resources. Murphy, Seizing the Means of Reproduction; The Economization of Life; Erika Dyck and Maureen Lux, “Population Control in the “Global North”: Canada’s Response to Indigenous Reproductive Rights and Neo-Eugenics,” Canadian Historical Review 97, no. 4 (December 2016).
510 Franklin to Charles Beaubien, March 4, 1976, Box 27, Folder 12, B1996-0004, UMFF-UTA.
wrote that it did “not distinguish between land in its various forms: land as a resource, an investment, as space that people need around them, and land as the only tax base of the municipality.” She went on, contending that the report failed to see the centrality of property ownership to city planning, and that “if the Council wishes to address this question of ownership, then it should face it and do so head on, but to assume that these problems can be solved without addressing the question of corporate ownership, the obligations that arise from it, and who legislates and enforces those obligations, seem to me a level of naivete that I would not like to see perpetuated.” Just as with her VOW activism, the questions of future energy use and economic development needed to include political restraint of corporate power.

Additionally, Franklin believed the report perpetuated nationalist views of trade as it assumed continued international demand for Canadian goods and, therefore, economic power. This, she argued, ignored the “new economic order” in which “the non-industrialized or less industrialized nations … band together in producer cartels or groups in order to achieve adequate compensation for their raw materials. Over and above that, there is however an increasing realization that all trade is mutual.” Franklin, an internationalist at heart who was always acutely aware of the ways national politics cannot be contained in political borders, revealed her acute awareness of the growing primacy of international economic markets.

Finally, Franklin pointed directly to questions of economic justice. She insisted that the report did not adequately consider economic equity when making arguments for food consumption and population. No matter how much food was grown, she contended, whether food could be sold came down to “price and who could pay for it.” The problem of resource scarcity lay not in numbers of people, but of their ability to access the resources they needed. In

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512 Franklin to Charles Beaubien, March 4, 1976.
short, Franklin concluded, “by not addressing itself to either the problems of trade, the problems of ownership, or the problems of land as a tax-base, the recommendations that I find in the report are in my opinion lacking in any logical base.”513 “Lacking in any logical base.” These were strong words against a technical report supposedly brought about by years of research. Franklin, although devoted to the need for scientific expertise in public life, was also acutely aware of science’s inability to grapple with questions of equality. Who benefitted from economic systems, who owned property, what relationship Canada should have with the rest of the world: these questions demanded public debate.

With the draft population report distributed to SCC members, Franklin and Fernand Seguin, a biochemist with popular TV and radio shows, again objected vociferously.514 They rejected the idea that there was a “magic number” for the Canadian population, contending that climate change, technological innovation, and changes in food production made it impossible to make such predictions. Seguin and Franklin insisted on focusing on the human costs of large-scale energy technologies, arguing that these “would lead to the loss of flexibility, democracy, and sovereignty.” They continued, arguing that technoscientific decision that replaced people with “capital and advanced technology” might “create a more difficult set of problems. The Report seems to imply that a choice could be made between people and machines. In our opinion this approach misses the central message of the current crises in our society.” With flexibility and alternative energy sources, Canada might have “more room for people” than the report suggested.515

513 Franklin to Charles Beaubien, March 4, 1976. For the New International Economic Order, see Selcer, The Postwar Origins of the Global Environment. Selcer suggests that NIEO was one response by the Global South to the discourse of limits, arguing that limits emerged from resource distribution and use.
515 Franklin and Seguin, “An Alternate View,” 1976, Box 27, Folder 12, B1996-0004, UMFF-UTA.
Their argument lay in the political repercussions of “capital intensive, energy intensive technologies,” which the report embraced “without discussing any of the social and human consequences of such politics.” Such technologies, the dissenters argued, “carry with them severe political, social, and environmental problems.” The assumption that technologies could replace human flexibility and diversity was, at heart, a question of citizenship: “The predominance of big technological projects at a time of resource scarcity can only bring a decrease in political and social flexibility. For the citizen, this means that fewer and fewer real decisions can be made by their elected representatives and democracy will lose ground and meaning.”

Seguin and Franklin believed specific technologies led to particular political relationships. Nuclear reactors did not provide grounds for participatory political practices or flexibility for material change over time. People needed to be given the power to discuss energy technologies and whether they met public need.

The Council responded to the minority report with little enthusiasm. In fact, the SCC faced the difficult decision of how to account for a minority report that emerged from an organization intended to provide clear, uniform, expert guidance for Canadian policy makers. One member “objected in the strongest terms to the concept of a minority report” saying it would set “a dangerous precedent” as it would remove the Council’s reliance on consensus. The council discussed various options, including printing the minority report as an appendix and voting via mail on how to deal with minority reports. The idea of “actually voting on policy,” however,

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517 Franklin had long been an antinuclear activist and throughout her life refused to work on advisory councils for nuclear waste. At the same time Franklin served on the SCC, she was also involved in protesting a planned uranium mine at Cluff Lake, Saskatchewan. See Box 39, B1996-0004, UMFF-UTA. See Langdon Winner for one approach to politics and technology. Winner, The Whale and the Reactor.
they viewed as “a much more dangerous precedent than publishing a minority view.” In the end, the published report contained no mention of a minority opinion.

In the final report, word choice hid Council disagreements. In his draft submission letter, chair of the Council Josef Kates wrote that “Even with such a moderated resource consumption and immigration policy, there is a concern that we will have to rely increasingly on large capital-intensive, energy-intensive technologies and, in the view of some Members [emphasis added], any resulting trend to centralized planning and decision-making carries with it some danger of adverse social and political impacts.” In the final version, this was changed to “the Council recognizes [emphasis added]…” The Council would speak as a whole, a united scientific front aimed at guiding public policy.

By the summer of 1977, the CS report was going through final edits. This process again brought the politics of technocratic report writing to the fore. The SCC made edits to the CS report to which Franklin objected. She wrote to the director, stating that “there is no point in hiding the fact that I am angry. I am writing to you because what is involved here are fundamental matters of policy well beyond the acceptance or non-acceptance of ‘editorial suggestions’. What is before me is not an edited version of the draft that the Conserver Committee approved and that was presented to Council. IT IS A DIFFERENT REPORT.” Franklin continued, “it is hard not to use the term ‘censored’” for the “suggestions” made in the editing process.

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521 Franklin to John Shepard, July 16, 1977, Box 28, Folder 3, B1996-0004, UMFF-UTA. Suurtanam mentions this exchange as well. Suurtamm, “Preserving Her Voice.”
Even through the director of the SCC reassured Franklin that no changes would be included without her permission and they would move forward with the original report, Franklin’s need to contend with such changes marks the highly politicized process of technical writing. While the SCC may have wanted to appear a unified body in their final documents, the road that led them there was far from smooth. SCC members engaged in discussions about the role of expertise and the place of participatory politics in technoscientific decisions. This was especially true of the conserver society, an SCC project that the committee intentionally opened to public participation. However, much like the technoscientific citizenship of AT groups, the conserver society entered the public imagination through discourses of gendered ecological domesticity, in which women were again depicted as conserving resources for the good of the nation and the planet.


While Franklin’s work on the SCC conserver society report emphasized the place of participatory politics and government responsibility for citizen well-being though economic control, the public life of the conserver society held different messages for Canadians citizens, and women in particular. Franklin’s view of government responsibility and economic nationalism was not specifically gendered. However, in articles the conserver society was primarily figured through female consumption.522 The public framing of conservation became that of personal responsibility for the earth depicted in terms of gendered consumption (Figure 18).

Figure 18. Home as imagined in Conserver Society Notes. Ursula Franklin Fonds, University of Toronto Archives.

Rather than a citizenship of scientific knowledge production and discourse, the image of Canadian conservers did not look much different from Canadian consumers: they (primarily women) were still enjoined to use products and pay attention to economic success, caring for the earth through economic choice. As one satirical depiction noted, “Perhaps [conserving is] impossible within the confines of a relatively affluent middle-class family … in a society that dares you to waste, begs you to waste, makes it so easy for you to waste.”

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A March 1977 section in the popular magazine *Saturday Night* revealed the gendered resonance of conserving citizenship. In “Waste: The New Pornography,” satirical articles suggested that, hot on the heels of women’s liberation, waste, not sexuality, would come to epitomize personal morality. Waste, the editor wrote, was “vicious, pernicious, and obscene, just like your grandma always told you.” Articles depicted the centrality of women’s domestic work – both consumption and household labor – to the success of the conserver ethic and correct conserver citizenship. Framing consumption as the successful successor to sexuality as the mark of women’s immorality was just the beginning of this gendered depiction of the conserver society.

In “Conserving: The New Morality – It’s patriotic, thrifty, and soul-satisfying,” a marriage slowly disintegrates due to a woman’s over-zealous conserving practices. The first step Naomi, a film producer, takes is to quit her job as “she’d need time to be a conserver.” Naomi works tirelessly to reduce the resources she and her family consume; the moment of “crisis” comes when her husband brings home cat food in “aluminum foil bags. Foil, that gigantic energy consumer, and Gordon didn’t have the interest to reject it! Was she going to carry this crusade alone forever?” It wasn’t Naomi’s worries over resources, though, that changed Gordon’s mind; it was the “marketplace” and the monetary savings of conserving energy. The article continues to touch on various debates related to conservation and economics. What if production fails because people are not buying things? worries Naomi. What would happen to jobs? She dismisses such

525 While other historians draw on this piece to understand the CS, none have discussed the gendered essence of the articles. Yet this article made an impression on contemporary readers, as authors in the CS notes on women argued that it provided a way to see women’s work in the home as a way to “scapegoat women as the source of excessive consumption in society.” Rebecca Peterson, “Impacts of the Conserver Society on Women,” *Conserver Society Notes* 1, no.2 (Spring/Summer 1979): 5.
worries, deciding that someone must be considering such implications. She has too much to do trying to be “independent.”  

Tucked into the conserver drama of Naomi, inserts suggested that the “wicked wasteful woman” was “so careless about conserving, she ought to be walking around with a Scarlet Letter on her chest -- not A for Adulteress, but W for Wastrel.” In contrast, the “Conscientious Conserving Woman may look like a latter-day temptress, biting into that apple, but really she’s an angel. She conserves. Constantly. Her kitchen is full of evidence of her honest-to-goodness godliness.”

Similarly, when authors of *The Conserver Society: A Workable Alternative for the Future* wanted to depict ideologies of consumption and conservation, they did so with characters such as Sammy Squander. When Sammy climbed to the top of Big Rock Candy Mountain, a consumer utopia, he encountered his girlfriend, Fiona Fragment: “There are dozens of Fionas, all the same size, shape, same face but with different clothes, different hair styles, different makeup. There she is a sporty-type redhead and over there she is as a groovy go-go girl dancing around on the mountain to the music.” Sammy, who wanted to do more with more, consumed women as he consumed cars or energy. Against a squandering of resources, authors of this parable of consumption set other avatars of human choice: Angus McThrift, who was always able to do more with less, and Rita Righteous, who did less with less and did something different. McThrift had no problem breaking up with Righteous as “her austerity and seriousness ha[d] turned [him] off completely.”

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526 Kurchak, “Conserving: The New Morality.”
530 Valaskakis et al., *The Conserver Society*, 98.
Though these works were satirical, the weight of domestic work associated with conservation did fall on women. For instance, one woman wrote to a newspaper that she could not “begin to tell you the anguish all the recycling and reusing has caused me!” and that her “family complained bitterly about the meals of ‘bulgur wheat and soy grits.’” This public image of the conserver society fit not with Franklin’s views of citizen protection and public debate but with late 1970s political trends that removed state support for citizens and made individuals responsible for their own well-being.

Franklin, in fact, later argued in her book *The Real World of Technology* that technologies alone could not bring personal liberation or political change. She contended that “promises of liberation through technology can become a ticket to enslavement … What turns the promised liberation into enslavement are not the products of technology *per se* … but the structures and infrastructures that are put in place to facilitate the use of these products and to develop dependency on them.” The conserver citizen, constantly worried about the right food to feed her family or the right cat food to buy, was not the citizen that Franklin aimed to cultivate in her technological activism. Nor was it what other women wanted, either.

Franklin received numerous letters from women who wanted to change their relationship to technology so that they could be technological and political producers in the public realm, not consumers in the domestic sphere. These women wanted to connect the CS to their professional and activist lives. One wrote that as member of a recycling committee she was giving a talk to the “Newmarket Business and Professional Women’s Group and I like to gather all available

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531 Quoted in McLaughlin, “Not an Easy Thing to Implement,” 231-232
material which I can to improve my talk and I like to know other women are very concerned and doing something about the pollution problem, energy crisis/waste crisis, etc."\footnote{Marlene Turner to Ursula Franklin, October 3, 1977, Box 9, Folder 7, B2015-0005, UMFF-UTA.} Another woman, part of a group exploring the relationship of changing work styles and the conserver society, noted that the CS “persuad\[ed\] us to accept more personal responsibility for the provision of basic needs, and also to recognize our interdependence,” as well as ask, “What values should we incorporate into our education system now to ensure that tomorrow’s citizens are more self-reliant, co-operative and creative – better prepared for the conserver society?”\footnote{Crystal Hutchinson to Franklin, July 26, 1978, Box 9, Folder 7, B2015-0005, UMFF-UTA.}

Still another letter from Waterloo Public Interest Research Group invited Franklin to a “one-day symposium dealing with the issue of women and the environments of the present and future.” The author had previously been “involved in food issues through conducting food supermarket tours and seeking a resolution to the acid-rain problem by presenting comprehensive information in an easily understood slide-tape show format.” She continued that the group wanted to “specifically address women and their effectiveness in a conserver society, what a conserver society will mean for social and sexual roles. We would also like to investigate the value of women’s volunteerism and the resolution of environmental issues.”\footnote{Joyce DeBoer to Franklin, January 8, 1980, Box 9, Folder 7, B2015-0005, UMFF-UTA.}

Such questions loomed large around the conserver society framework. What would a society built around conservation mean for those most responsible for consumption? Could it change women’s place in society? Franklin would want to answer yes; the public images that linked white, middle-class, heteronormative domesticity to conservation practices offer an opposite conclusion. Women were aware of these contradictions and gave voice to their concerns in one of the last issues of *Conserver Society Notes.*
“Who Will Be Doing the Work?”: Feminist Critiques of the Conserver Society

*Conserver Society Notes* published a special issue on “Women and the Conserver Society” in the summer of 1979. The guest editor Rebecca Peterson, a professor of Environmental Studies at York University, introduced the volume, stating that the relationship between the environmental and women’s movements had not been fully explored. The articles, however, rarely discussed either movement directly. Rather, they focused on the gendered structural inequities that made women bear the brunt of conservation strategies. Discussions of the ways personal responsibility related to structural change threaded through this issue.

Only one author, a woman living with her mother and daughter in a three-generation energy-efficient house, celebrated the conserver life. She declared that designing her own home was “what liberation is all about!” Rather than pointing to political and structural change, she insisted individual choice gave women incredible power:

> Most of the power at a home-making level lies in our [women’s] hands. I would suggest that women, and their decisions about how the money in a home is spent, hold the key to any major shifts in the economy of the nation. Women’s decisions to work, or not to work; to bear children, or not to bear children; to live at a specific standard of living in relation to the rest of the community; and to set the fashions of the day are more powerful than we think.537

In contrast, the other articles pointed directly to the unequal economic and political structures that led women to bear the burden of resource conservation. They argued that women were excluded from full technoscientific citizenship and the power it conveyed. As one contributor wrote,

> women recognize very well that in the current setting, the source of an energy supply is quite independent of their desire to play a fuller role in society, to achieve equal access to the professions, to have control over the development of

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537 Lorna Seaman, “Prospect House: A Three Generation Female Experiment,” *Conserver Society Notes* 1, no.2 (Spring/Summer 1979): 11.
their environments, obtain employment an equal pay, or to be able to share household tasks and child rearing with their male partners.\textsuperscript{538}

This author insisted that women’s public life could be limited by their private responsibilities, a concern that echoed through this issue. One asked if a conserver society required an increase in manual labor in order to reduce mechanical energy, “who will be doing the work?”\textsuperscript{539} Authors argued that “within a conserver vision, what has become of women’s record of activities, achievements and dissatisfactions? We suspect that it has been made invisible in order to facilitate a romanticization of certain aspects of a conserver society, i.e., the moral superiority of human labor, and the idealization of the heterosexual nuclear family as a self-regulating and natural unit.”\textsuperscript{540}

Alongside calling out the “romanticization” of household labor and the family as a “natural unit,” authors pointed directly to the structural inequities in women’s employment opportunities and salaries. Women were more likely to be impoverished, live in single-parent households, lack transportation, and lack basic job security in the service economy that, they insisted, was not more satisfying than other forms of under-paid and under-protected work.

As these women argued in 1979, the conserver society failed to grapple with the sexual division of labor and women as a temporary, cheap labor force. And yet women’s relationship to economies lay at the heart of debates over environment, ecology, and global limits. Women’s unpaid work made social reproduction and material production possible, and the sexual divisions of consumption lay at the heart of the conserver society. Indeed, these articles underscore the questions geographer Sara Nelson insists we must answer in terms of ecological stewardship:

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what “labors are valued and devalued …, what processes of racialization, gendering, and subjectivization are involved in transforming communities into stewards of ecosystem[s]?"541 At the end of the 1970s, women argued that providing solar technologies or fuel-efficient vehicles failed to address the political and economic structures that relied on their unpaid domestic work and their underpaid work out of the home.

Conclusions

Franklin, despite her years chairing and championing the conserver society, saw it as a failure – the Canadian government, she felt, had failed to act on the recommendations. Although intended in all ways to “minimize disasters” and plan under “the realization that decisions taken today, in such areas as energy and resources, may have irreversible and possibly destructive impacts in the medium to long term,” the “the public policy recommendations were not taken up by the government of Canada in 1977” and the “onslaught of gain-maximizing strategies” which took hold in the 1980s increased environmental destruction and lessened governmental actions to protect their citizens.542

Franklin, in advocating for the conserver society, wanted exactly the opposite. She desired more government responsibility in order to enhance the “freedom” of all people. The conserver society report stands as a remarkable document not because it was successful – it was not – but because it represented an alternative to the economic world order that was coming into existence in the 1970s.543 While Franklin imagined governmental responsibility, held in line by citizen speech-acts, the opposite took hold: personal responsibility for one’s own health and

541 Nelson, “Beyond the Limits to Growth,” 475.
542 Franklin, The Real World of Technology, 83. Franklin, in contrast, celebrated the Berger Inquiry for its ability to incorporate the “context” of technological decision-making through “participatory and interactive” planning. This “resulted in a workable plan to proceed with development while minimizing potential harm (82).”
543 Harvey, A Brief History of Neoliberalism.
safety, while governments protected the property rights of corporations and industry. The
promise of an altered economic system that lent equality of environment and political power to
all people never materialized. In fact, although historians have celebrated the conserver society
as a moment in which the Global North contributed to the expansion of sustainable economic
nationalisms, the historical trajectory did not take most of the world into a conserver ethic.
Rather than eco-development and practices of growth predicated on ethical considerations of
harm and a common humanity, the rise of deregulation under neoliberal policies made the
extraction of natural resources and fossil fuel energy sources continue apace.\textsuperscript{544}

Franklin continued to argue for the centrality of public participation, government
accountability, and democratic processes in technological decision-making. Her Massey lectures,
printed as \textit{The Real World of Technology}, became the best-known articulation of these ideas.
Drawing her title from her friend C.B. Macpherson’s \textit{The Real World of Democracy}, Franklin
argued that because technologies emerged from specific social, economic, and political contexts,
what was needed was “nothing short of a global reformation of major social forces and of the
social contract [to] end this historical period of profound and violent transformations.” She
continued, stating that “such a development w[ould] require the redefinition of rights and
responsibilities, and the setting of limits to power and control … Central to any new order that
can shape and direct technology and human destiny will be a renewed emphasis on the concept
of justice. The viability of technology, like democracy, depends in the end on the practice of
justice and on the enforcement of limits to power.”\textsuperscript{545} Justice, equality, “enforcement of limits to
power.” These speak not to personal responsibility of consumers in private domestic realms but

\textsuperscript{544} This follows Clowater’s argument that the SCC moved from seeing science as a way to transform the state to
seeing science as “an instrument of commercialization and profit-making.” Clowater, “Information Kiosk on a
Highway to Nowhere,” ii.
\textsuperscript{545} Franklin, \textit{The Real World of Technology}, 5.
to the necessity for governance of the public realm, governance that reflects the responsibility of nations to support all citizens.

The notion of a conserver society marked both the culmination and retreat of technological advocacy intended to reform the links between publics, economics, and a limited earth. The conserver society was not, indeed, successful, as the appropriate technology movement itself was not a lasting success. Neither revolutionized broader social, economic, or political systems to bring justice, participation, or reduced harms to humans and the “biosphere.” However, as the women’s response to the CS suggests, feminist responses to the linked issues of social and ecological justice were proliferating. Such women participated in what Franklin calls the “great contribution of women to technology,” which for her was the ability of women, long denied technoscientific citizenship, “to change the technostructures by understanding, critiquing, and changing the very parameters that have kept women away from technology.”546 The next chapter turns to the ways in which women demanded technoscientific citizenship, arguing for their right to be part of the construction of technology and the production of scientific knowledge in order to change relations of political power.

546 Franklin, The Real World of Technology, 104.
CHAPTER 7

“SOMETHING DUE”: FEMINISMS, TECHNOSCIENCE, AND ECOLOGY

What was the relationship, women asked throughout the 1970s, between women, technology, and ecology? They discussed this in radical science publications, appropriate technology magazines, and at conferences dedicated to the topic. At one conference, “Women and Technology: Deciding What’s Appropriate,” women met to discuss the “connections between major social concerns of the 1970s: the changing roles of women and the impact of advanced energy-intensive technologies on the environment and quality of life.” As the previous chapters have shown, women had been integral to the success of the appropriate technology movement. In many ways, AT allowed them economic freedom and personal independence. However, women increasingly began to analyze not only the ways AT organizations may not have been as liberating as they imagined, but to extend their theories of the relationship between technology and equity to wider social critiques. These women expressed their techno-social analyses in a variety of ways, attempting to find middle ground between technological choice, environmental protection, and women’s social, political, and culture relationships.

Women formulated their relationship to technoscience and feminism through the foundations of AT’s radical critique. They, too, questioned the hierarchies of economic and political power that conventional science supported. They did so, however, through the lens of white feminism which theorized gendered hierarchies of power created by women’s place in economic and political systems, as well as the cultural construction of femininity. Through

articles and special issues on women’s relationship to technoscience, individuals constructed new political identities and brought their concerns into the public realm. They argued that women were differentially affected by technologies. They claimed the ability to be technoscientific citizens for themselves, assuming the right to produce knowledge in order to move away from “second class” citizenship.\textsuperscript{549} In doing so, they claimed independent personhood. As Nancy Jack Todd of the New Alchemy Institute wrote in an article on women and ecology, “Our goal for every woman must be a sense of completion; of destiny as a person, not as wife, mother or mistress, but as herself first, all other roles being secondary.”\textsuperscript{550} And yet a tension lay within the writings of these women, as they also suggested that their place of difference as women could provide a means to move beyond what they saw as the violence of modern technologies. For as Jack Todd also noted, “is it possible that the immanent essence of women, rooted more firmly in the processes of nature, might find a way to shape a better world?”\textsuperscript{551} The technoscientific feminism women constructed was multivalent.

This chapter looks first at the ways women untangled the relationships between feminism, technology, and environmentalism.\textsuperscript{552} In doing so, it discusses the ways feminist political identities were shaped in the pages of AT journals, and the ways women brought their concerns over women’s oppression and the harm caused by certain technologies to the public sphere. These discussions indicate a shared genealogy between feminist science and technology studies (concerned with gender and technoscience) and ecofeminism (concerned with nature and gender). I then turn to discuss the conference Women and Life on Earth (1980) which scholars

\textsuperscript{550} Todd, “Women and Ecology,” 115.
\textsuperscript{551} Todd, “Women and Ecology,” 118. Much scholarship has critiqued this essentialist view of women’s connection to nature. For instance, see Sandilands, \textit{The Good-Natured Feminist}.
have described as a point of origin for the ecofeminist movement. I argue that WLOE came directly out of women’s technological critiques over the previous decade. At WLOE, women came together to discuss the relationship between militarism, ecological devastation, and women’s political voice. Yet just as with women’s disarmament organizing 20 years prior, Black women spoke out against white women’s narrow focus, providing alternative views of women’s relationship to economies and life on earth. They argued that the idea of liberation through tools, available to white women, proved insufficient to deal with structural inequalities. While a unified “woman” could not be found to care for life on earth, the conversations about feminism, technology, and ecology offered an important insight: that all technoscientific decisions reside in the realm of politics.

“Something Due”: Feminisms and Technological Critique

Throughout the 1970s, women wrote in publications devoted to AT and radical science about the relationships between feminism, technoscience, and environmentalism. In doing so, they created feminist political identities not through the space of women’s liberation magazines, but in publications devoted to the question of the social shaping of technology. As they had been part of AT organizations, some of their critique began with the relationship of women to the goals of this movement, which one activist described as “simply matching the energy source to the end use you want to obtain.”553 For women, this understanding of technological activism was entirely insufficient. As Judy Smith, author of “Something Old, Something New, Something Borrowed, Something Due: Women and Appropriate Technology,” asked, “What are we women going to do in the sense of trade-offs between our power, our equity, and energy

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development?" Or, as Jan Zimmerman, another feminist concerned with women’s relationship to technology, put it bluntly, “Who’s being asked to do the giving up?”

Analysis of women’s relationship to technoscience and environmentalism appeared in articles and special issues of many AT journals, including *Journal of the New Alchemists, Rain, The Whole Earth Catalog, Science for People, Science for the People*, and *Undercurrents*. In these pages, women’s analyses took several forms. As feminist science studies scholar Banu Subramaniam points out, early feminist science studies focused on women in science, later attending to women and science, or the gendered construction of scientific knowledge. Feminist analysis of technoscience occurred in the same fashion, and in fact science and technology were often addressed in the same journals. In print, women laid claim to the right to direct technological development, arguing that this would provide political power, while also indicating the ways women were differentially impacted by technologies. They also described science and technology as constructed by race and gender.

Articles gave a broad structural critique of women’s economic position and the ways it made them more vulnerable to a politics of scarcity. Women, they insisted, were “the primary victims of energy-intensive design.” Women had to deal with the domestic reverberations of

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556 Subramaniam, “Moorcd Metamorphoses.”
558 They were thus part of early feminist science studies, which included works by people such as Sandra Harding, Donna Haraway, Carolyn Merchant, and others.
energy shortfalls and economic crises; those that lived as single wage-earners with children bore
the brunt of 1970s economic tumult. In her piece in *Conserver Society Notes*, Rebecca Peterson
called for a study of the “distributional effects of all planned scarcity policies.” Because of
their economically disadvantaged position compared to men, women were hit hardest by energy
conservation measures in the era of limits to growth.

Women’s economic oppression, authors argued, stemmed partially from the fact that they
were denied equal access to, and equal treatment in, high-paying and high-status scientific
professions. As the Women and Science Collective put it in the women’s issue of *Science for
People*, they were trying to understand the “position (or rather the exclusion), of women in
science, and the ways in which science adds ideologically and technologically to the oppression
of women.” Science, for these women, was “sexist” in its labor force and its production of
knowledge. As the Collective continued, women scientists “work in deeply hierarchical, class
divided, racist and sexist institutions.” In science, women were primarily laborers, working as
technicians, secretaries and cleaners, this collective claimed. If women were scientists, they
faced exclusion and discrimination based on their gender. As Liz Manton reported, female
scientists faced isolation and prejudice from their male colleagues. One scientist reflected on the
masculinity of science, noting that “the personality characteristics of the successful scientist:

560 Rebecca Peterson, “Impacts of the Conserver Society on Women,” *Conserver Society Notes* 1, no.2
(Spring/Summer 1979): 4.

561 “Statement by the Collective,” *Science for People* 29 (Spring 1975): 3. This included Anne Cooke, Zoe
Fairburns, Dot Griffiths, Brigid Hogan, Zoe Reed, Hilary Rose, Esther Saraga, Li Shen, Lesley Walker, Judith

publications went on to long careers in untangling the relationship between scientific and feminist epistemologies.
For instance, Hilary Rose was founder of British Society for the Social Responsibility of Science, part of women’s
collective issue in 1979, a year before the Brighton Women and Science Group. See Subramaniam, “Moored
Metamorphoses,” 955. For critiques of women in the sciences, see “Equality for Women in Science,” *Science for the
2021. The British and American radical science movements held similar goals. See David King and Les Levidow,
“Introduction: Contesting Science and Technology, from the 1970s to the Present,” *Science as Culture* 25, no. 3
(2016).
independent, assertive, dominant, able to suspend prior judgment, interested in things rather than people etc. overlap exactly with those of the male in our society.”

Similarly, Judy Smith insisted that “In our society, whether we’re talking about traditional … technology, or alternative … technology, we’re talking about what has been defined as men’s work.”

Exclusion from science and technology, women argued, refused them access to economic independence and full citizenship. As one wrote, women “need to develop a much greater understanding of science and need to be fully involved in the creative and decision-making jobs to avoid exploitation. Their involvement in a high status, public activity is essential to change a great many other aspects of their being treated as second class citizens.”

These women identified the political power of science at a time of increasing technocratic governance and insisted that women be allowed entrance into this form of public life (Figure 19).

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Figure 19. Cover of Women’s Collective Issue of Science for People. Depicts women’s unequal place in science related to pregnancy, childcare, and men. From the British Society for the Social Responsibility of Science.

Women tied the discrimination they faced in technoscientific professions to their continued domestic responsibilities, directly critiquing the ecological domesticity many AT organizations promulgated when describing their technologies. They argued that AT too often romanticized domestic labor. The women at the National Centre for Alternative Technology asked, “Does A.T. mean more domestic labour? … Do women have as much choice of their type
of employment in an A.T. society as men?” An embrace of the home, they suggested, led to a false embrace of women’s domesticity, which in its lack of state support (especially in the drawdown of welfare during the economic crises) provided “a sobering contrast to the utopian ‘women and AT’ vision of the reintegration of home, work and childcare … The wages are derisory, the work environment often dangerous, … job and income security are non-existent.”

The celebration of domestic work, these women argued, was central to an economic system that devalued women’s paid work. As the Women and Science collective asserted, working outside the home made women victims of double the “labour and double [the] oppression.”

The “social significance” of domestic imagery, some argued, needed to be “considered at a time when capital wishes to force part of its ‘reserve labour’ back into the home.” Or, as another contended, devaluing women’s paid work continued to make women “an expendable commodity.”

Women argued that their subordination was the result of “patriarchal capitalism,” something much of AT did not take into account. As Ruth Elliot argued, “the critical end of the AT movement has moved from a concern with the nuts and bolts of technology to a search for new strategies that could challenge the locus of economic power.”

In their analysis of women’s domestic labor, they focused on the ways technologies could constrain women’s ability to complete tasks of caring for themselves, children, and homes. For instance, one woman watched Earth Day activists burning cars, and wondered what that meant for mothers needing to convey children to school or the hospital, something one “appropriate”

572 Elliot, “Bringing it All Back Home,” 18.
technology (bicycles) could not accommodate. In many journals, feminist appropriate technology revolved around questions of birth control and childbirth. Some argued that the pill was inherently appropriate, as it allowed them to control their independence from the economic weight of raising children. Others embraced the women’s self-health care movement, as this provided ways for women to take control over their own bodies. Articles also dealt with alternative birth control practices (such as lunaception) and natural childbirth, all of which, like the women’s health movement, could be seen as providing individuals control over their bodies. For these critics, “a technology that saves women’s time or expands their role options is almost by definition appropriate.”

Alongside these analyses of women and technoscience stood argument about the ways technoscience was constructed though race, gender, and class. The Women and Science Collective asserted that “class and racist values have penetrated the knowledge-system itself,” but that most radical science did not account for something else: “the sexist dimension of capitalist science.” Articles recognized as well the ways gender and race intersected in


576 For an example of women’s reproductive technologies in an AT catalog, see De Moll, Rainbook: Resources for Appropriate Technology, 183-184. Michelle Murphy analyzes the women’s health movement. Murphy, Seizing the Means of Reproduction.


women’s relationship to public life. \(^{579}\) Women contended that technology was also constructed through gender, as was nature. For as Corky Bush, a women’s historian, asserted, technology and nature were constructed from “reciprocating metaphors, in which “the images are men, work, machinery, technology and violence; the reciprocating images for women, waiting, land, nature, beauty.”

After detailing the cultural construction of technology, Bush asked “will women have to continue to walk the rails of technology while men ride?” \(^{580}\) The answer, for these women, was no. Simultaneous with their theoretical critique of feminism and technoscience, women claimed technoscientific citizenship, seeing in AT ideologies a grounding for their political endeavor. They contended that “since [AT] deals specifically with questions of power and control, giving power to oppressed groups, including women, is a central issue within appropriate technology, because in order to be truly appropriate, something must be appropriate for everyone, not just for white males.” \(^{581}\) Women preempted appropriate technology methods by laying claim to women’s liberation through tools and science.

Women took on building projects, working in women-only groups to overcome the masculinity of labor in construction, architecture, and other male-dominated enterprises. In the feminist appropriate technology group “Country Women,” they argued that “The Farmer’s Wife is praised and the woman farmer is sneered at. And once again the woman is made to stay in her place. But if country women get together and teach each other more things than their granola recipes and if reading about sheep in this magazine convinces you to start your own flock, then it

will change.” They wanted to be farmers, not just farmers’ wives. They also made demands for political change, addressing the economic and social factors that limited women’s participation, arguing for public daycare (creches) as well as shared domestic labor.

A solar greenhouse promised, for appropriate technology enthusiasts, self-sufficiency, democratic control of energy, and ecological well-being. For women, building solar greenhouses, cold frames, and other solar technologies came to represent something more: women’s liberation. At conferences, women learned how to build cold frames. One group, the Solar Greenhouse Women’s Guild, ran a series of workshops on building greenhouses, insisting that “we feel strongly that solar greenhouses will help women take more control over our lives in terms of food and energy.”

They saw their appropriation not only as personal liberation but as a place to change technoscience itself. As part of the AT movement, they had been concerned with the destructive impact of specific technologies on the environment and humans. If they continued science and technology as usual, they might gain technoscientific power but be “confronted with a world threatened by terrifying dark shadows; over-population, famine, a heedless scramble for the last of the world’s finite energy sources, the threat of war, possibly nuclear, from countries who have suffered our affluence too long, and the development of nuclear plants with the age-long radioactive wastes they will produce.” Thus it was imperative to gain technoscientific power but also bring change to the endeavor. As one wrote in Undercurrents, maybe women should not embrace science as conducted by men but “females should reject those aspects which emphasize

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commercial rather than social goals, individual achievement rather than the increase of scientific knowledge and *strive to change the approach to science rather than their own approach.*”

Through their difference, they could overturn the violence of technological modernity and science that did not take human needs into account.

Yet women did not agree on how they stood in a differential relationship to the public discussions of technology. For some the central question was one of historical social and economic exclusion and a continuation of women’s relegation to the private sphere. These women argued they were different because they had been excluded from political and economic power. For others, women’s difference lay in their biology, as their reproductive capacities and maternal care made them the potential creators of more humane and ecological technologies.

Women suggested that their essential biological difference could provide the grounds for constructing non-violent technologies. As Nancy Jack Todd wrote, “One wonders … if man with his transcendent quality has dominated nature and brought us to this point in history, is it possible that the immanental essence of women, rooted more firmly in the processes of nature, might find a way to shape a better world? Could we be more capable of a better understanding of what might be called human ecology?”

A woman’s nature came from her reproductive capacities as well as her care for the home through skills such as weaving, cooking, and gardening. For Jack Todd, motherhood, now made optional through birth control technologies, deserved elevation as an occupation: “Given a society not so completely out of touch with

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585 Manton, “And Here Begins Our Alienation from Science,” 15.
586 Many scholars have written about relationships of difference within the category “woman” and as it relates to the production of scientific knowledge. Joan Scott discusses the problematic produced when assume everything within a category is the same. Scott, *Gender and the Politics of History.* Catriona Sandilands rejects women’s claims to earthly care through their domestic care. Sandilands, *The Good-Natured Feminist.* The range of feminist science and technology studies is vast, I draw mostly on those who pay attention to the changing, historically contingent relationship women have to the practices of technoscience.
natural rhythms, the role of a mother has too much love and joy and fierce pride to be the draining, demoralizing, second-rate occupation that it is currently considered to be.\textsuperscript{588} Stephanie Leland asserted that “the Earth is our home. As managing and caring for one’s home is inherent in woman’s nature, woman must make herself heard within the ecological movement.”\textsuperscript{589}

Women’s position as caretakers and reproducers, in these accounts, also meant that their skills needed to be celebrated. Jack Todd highlighted gardening, as well as “Pottery, carpentry, spinning, weaving, and making hand-crafted jewelry [as] types of work that are at once satisfying and non-destructive.”\textsuperscript{590} Brenda Vale, author of the \textit{Autonomous House}, and others celebrated the AT prospects for knitting in the \textit{Undercurrents} women’s issue, stating that “When women use their inborn caring power to care for their homes they are able to create energy. Each household task carefully done gives off energy; add to this a well-insulated home and they are able to conserve energy too.” They concluded that “Women have such power - we must learn to use it.”\textsuperscript{591}

This embrace of women’s biological difference took root at a time when the centrality of maternalism to femininity was rapidly changing. Women from across the AT world discussed the balance between public independence and maternal care in a 1979 issue of the Land Institute’s \textit{Land Report} that honored the “International Year of the Child.” In her introductory passage, Land Institute cofounder Dana Jackson argued that “the image of woman as a housekeeper and mother can easily be expanded to the image of woman as an earthkeeper, the nurturer and protector of life … This special sense of responsibility for children causes them to care intensely about their children’s future.” In order for women to “give their children a healthy planet to

\textsuperscript{588} Todd, “Women and Ecology,” 125.
\textsuperscript{590} Todd, “Women and Ecology,”126.
inherit,” Jackson suggested that “some women who accept responsibility as citizen activists may eventually develop full-time careers working in the public interest.” All of the contributions came from “mothers” who also “work[ed] full time in public interest careers.” A wide variety of women participated, and many discussed the need to overturn relations of power. Hazel Henderson, an activist economist, looked toward “intergenerational justice, as well as for greater equity in access to resources for all people alive today,” while Harriet Barlow of the Institute for Local Self Reliance spoke of “honoring a tight political analysis, building an organization that includes all the interests that speak to the protection of the life process.” Pat Lewis Sackrey of the Center for Rural Communities wrote that AT “has everything to do with power, I think, individual and community, national and international. Power has a lot to do with who knows what and who can do what to whom,” underscoring the centrality of epistemological power to politics.592

Women writing in AT publications articulated feminist identities based on structural exclusion from technological, economic, and scientific power. In this, they aligned with what some historians have labeled radical feminism, which provides a structural critique of women’s public relationships. In these publications, however, women also articulated a technoscientific feminism based on women’s essential biological difference from men, what is largely labeled as cultural feminism. Both forms of feminist technoscientific subjectivities appeared in the same journals, indicating the openness and flexibility these new political identities allowed.593 Women found the feminist movement not only in women’s liberation magazines, but also in publications devoted to science and technology. At the same time, they also brought their concerns into the

593 Murphy moves beyond the cultural/radical definitions by discussing “protocol” feminism, or feminist identities formed through shared practices. I would suggest that feminist political identities shaped through AT journals align with Murphy’s concept of “protocol feminism.” Murphy, Seizing the Means of Reproduction.
public sphere. They argued that people had to account for women’s relationship to technology, suggesting that gender needed to be included in public decisions about energy and infrastructure.

The Women and Life on Earth conference, held in Amherst Massachusetts in March of 1980, emerged from these decade-long conversations about the relationship between women, technology, and ecology. The women that convened the conference had been working in technological critique for the last decade, including women from the New Alchemy Institute and antinuclear activists. The conference, much like the debates in the preceding decade, insisted that women should be able to assume technological and scientific (and therefore political) power, while also emphasizing that women could transform human’s relationship to nature. Their concern, much like that of the radical science and environmental movements, was of the destructive impact of modern technologies on all living beings. To this, though, they added the lens of feminism and women’s particular vulnerability to technoscientific-political structures. Their response lay in claiming political power to contest the violent power hierarchies of who had the ability to speak for nature.

Ecology as a Political Word: Women and Life on Earth Conference, March 1980

In August of 1979, a group of women loosely affiliated with Goddard College and Murray Bookchin’s Institute for Social Ecology in Vermont met to plan the conference “Women and Life on Earth.” In a funding proposal, they described the need for such a gathering in apocalyptic terms: “We live at a unique moment in history,” they asserted, “Many women feel they can no longer remain observers of the course of history but must become active in the

struggle to preserve the continuity of the human experience, to offer hope of a future to their and
to all children, and to become guardians of what e.e. cummings called that ‘gay great happening
illimitably earth.’” The conference that resulted from their planning continued to try to answer
the questions that framed women’s writing in AT journals. What was the relationship between
feminism, ecology, and technology?

From March 21 to March 23, 1980, around 550 women gathered at the University of
Massachusetts-Amherst to discuss the relationships between ecological issues and feminist
concerns. In her opening speech, Ynestra King, a social theorist at Goddard, declared, “We’re
here to say the word ECOLOGY and announce that for us as feminists it’s a political word - that
it stands against the economics of the destroyers and the pathology of racist hatred. It’s a way of
being, which understands that there are connections between all living things and that indeed we
women are the fact and flesh of connectedness.” For these women, ecology was a political
word because, as the New Left and theorists such as Murray Bookchin asserted, environmental
ills stemmed from systems of oppression in social, economic, and political structures.
Crucial to an understanding of ecology as political was their focus on the differential effects of the
impacts on women.

The “Women and Life on Earth” conference receives passing mention by most historians
interested in alternative histories of environmental activism and ecological thought, including
Robert Gottlieb and Carolyn Merchant. They place this conference as one of the origins of
ecofeminism which, according to Robert Gottlieb, consists of “an amalgam of different

No. 1, April 18, 1980, Box 3, WLOE.
597 Merchant, American Environmental History. Gottlieb, Forcing the Spring; Marianne Hirsch, “‘What We Need
Right Now Is to Imagine the Real’: Grace Paley Writing against War,” PMLA 124, no. 5 (2009): 1769.
perspectives and approaches about the human/nature relationship and the integration of feminist, ecological, and anti-militarist ideas. “Often, scholars categorize WLOE as part of specifically feminist activism, especially that related to antinuclear protest. However, the focus on women and nature hides the fact that participants were more focused on who had the ability to construct scientific knowledge, the differential impacts of technoscience, and who had the power to decide how technologies were used. This attention makes it a place of origin for the field of feminist science and technology studies as well. Additionally, WLOE may be better seen as a moment of conclusion as well as emergence: a moment that brought together the varied ways women had tried to voice connections between feminism and ecological activism over the preceding decade, and in doing so provided a space for an articulation of feminist identities grounded in material politics. As a woman wrote, asking to come to the conference, “I feel that we wimmin [sic] need a conference of this kind badly – given these near-apocalyptic times, where men in government, industry, in science are steering our country, our earth, our lives in a near suicidal fever.”

The conveners of WLOE were long-time activists in a variety of fields, including feminist media, ant-nuclear activism, and appropriate technology. In an interview, Anna Gyorgy, a conference organizer, recalled the salience of the political moment and the long-time connections of these women: “the movement of women in environment and agriculture but with a political sense which was so exciting when twelve of us came together after the Three Mile Island accident … it was women who had known each other through different movements.”

Conveners included Ynestra King; Celeste Wessen, the news director at WBAI in NY; Nancy

598 Gottlieb, Forcing the Spring, 304.
600 Sara Elinoff to Sue, January 24, 1980, Registrations, Box 1, WLOE.
601 Anna Gyorgy, interview.
Jack Todd and Christina Rawley, both at the New Alchemy Institute in Falmouth, Massachusetts; Grace Paley, a long-time peace activist and writer who lived in Vermont; Anna Gyorgy, a communard and antinuclear activist; Goddard student Carol Iverson; and Jane Coleman-Bookchin who was writing a book on women and ecology. They organized the conference to “clarify the relationships between feminist and ecological issues [in order to] lead us to more effective political action.”602

These women had long been active in connecting militarization to their homes and bodies. For instance, Paley and Jack Todd were both members of the Women Strike for Peace movement of the early 1960s, a movement that historian Jenna Loyd argues was successful in building coalitions across races and nations in the name of human health.603 Many were also active in New Left circles and drew their political-economic critiques from the New Left.604

Many of these women had participated in both AT and antinuclear work in New England, particularly in the Clamshell Alliance that took direct action against the Seabrook nuclear plant in New Hampshire. Anna Gyorgy was a member of the Montague Farm collective which took the lead in this antinuclear activism.605 Gyorgy went on to edit a seminal book against nuclear power, No Nukes: Everyone’s Guide to Nuclear Power, in which she asked these questions of...
energy: “Whom does it serve; who controls it; and what are its costs in social, environmental, and financial terms?”

Jack Todd and Rawley had also been participants in antinuclear activism. On August 22, 1976, Christina Rawley was one of 179 “New England citizens” arrested at the site of the planned Seabrook, New Hampshire, nuclear power plant. Over 2000 others gathered to support those arrested for criminal trespass. As Rawley articulated in an interview, her AT work tied directly to her antinuclear stance: “also the antinuclear group, I just was so drawn to it … to bring to the antinuclear group the information that we were developing at New Alchemy Institute. You have to stop this, the nuclear power and then what do you replace it with? How do you go forth?”

Organizers intended WLOE to answer this question: how should women go forth, when faced with recent disasters such as Three Mile Island and continued gendered inequality? The three-day event included shared meals, art exhibits, and panels. The collective “Common Women” served food and “Men Against Patriarchy” tended children. Participants had the opportunity to build a solar window box to practice technological skills that could provide women’s technological (and economic) independence, as well as view feminist ecological art. The first day began with a talk by Lois Gibbs, famous for her Love Canal activism, who told her audience about “the research techniques used by young housebound women with small children,

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606 Sloneker, A New Dawn, 142.
607 “Support of Citizen Occupation,” The New Alchemists Newsletter (Fall 1976): 3, Box 33, Folder 5, NAI-ISU.
608 Rawley, interview.
609 Natasha Zaretsky argues that Three Mile Island “signaled the birth of the ecological age.” Natasha Zaretsky, Radiation Nation: Three Mile Island and the Political Transformation of the 1970s (New York: Columbia University Press, 2018), 1. The genealogy I have traced here suggests this is not the case, and other historians agree. Marill Hazlett, for instance, places the “ecological turn” at the beginning of the 1960s, while Sabine Höhler writes of implications of “Spaceship Earth” for an awareness of global ecological connection. Höhler, Spaceship Earth; Hazlett, “Voices from the Spring.”
610 See evaluations for questions regarding food served by “Common Women,” Box 3, WLOE. For “men against patriarchy,” see Christina Rawley to Emma Missouri, January 14, 1981, Box 5, WLOE.
611 Baum, “Earthkeeping, Earthshaking.”
their stubbornness, their angry move into the world and against industry which was poisoning them, the effects on their homelives.” Theory panels accompanied those on “modes for action,” all attempting to understand women’s relationship to ecological devastation and hierarchies of power.⁶¹²

WLOE focused not only on environment but multiple valences of human inequity and violence – theirs was a political critique of militarism, science, and systems of power. The workshops represented a wide variety of concerns, related to health, women’s economic status, relationship between race and the environment, cultural constructions of nature, appropriate technology, critiques of science, and antinuclear concerns. At one workshop, led by Katherine Carlotti of the group Harlem Fight Back, participants worked on “confronting and becoming sensitive to racism in the women’s movement and environmental movements,” and asked, “what can we begin to do as women to break down barriers?” At another, titled, “Black women and our natural environment,” panelists asked: “What is the ‘natural’ environment of black women? Is there a place for black women in the environmental movement? Is racism an environmental pollutant?” Still another asked, “Is there a feminist science?” Participants could also attend workshops such as “Women, Militarism, and the Arms Race,” “Confronting Our Racism,” “Genetic Manipulation: Theft of Motherhood?,” and “Women in the Trade Unions.”⁶¹³ Speakers included not only appropriate technology leaders such as Jack Todd, but also scholars of

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⁶¹² Ynestra King and Grace Paley, “Looking at the Conference,” Women and Life on Earth: Post-conference Mailing No. 1, April 18, 1980, Box 3, WLOE. Many conference participants saw Gibbs’ speech as a highlight of the event. See conference evaluations, Box 3, WLOE. Elizabeth Blum discusses the ways the activism at Love Canal was shaped by race. Elizabeth Blum, Love Canal Revisited: Race, Class, and Gender in Environmental Activism (Lawrence, Kansas: University Press of Kansas, 2008). Amy Hay suggests that through their maternal activism, women at Love Canal could take on new citizenship roles. Hay, “Recipe for Disaster.”

⁶¹³ “Conference Schedule,” Box 1, WLOE.
feminism and science, including members of the collective Science for the People, as well as Evelyn Keller and Ruth Hubbard.614

Discussions addressed the fact that women had little say in the scientific process or technological change, arguing that they were thus removed from equality in politics. H. Patricia Hynes gave a speech linking women’s exclusion from the realm of knowledge to the ensuing devastation of the world by masculine aggressive science: “If, as philosophers of science assert, technology is an extension of the body, it is very clearly in recent times the extension of the male body.” Hynes continued, “War aggresses against soil, the oceans, vegetation, animals, insects: the entire earth … Death, radiation fallout, radiation sickness assaulted the cells, the interstitial spaces of all living being faster, farther, and deeper than ever before in history when atomic bombs were dropped in Japan. The herbicide, Agent Orange, used in the Vietnam War to kill vegetation in that agrarian country, continues to have devastating effects.”615 For Hynes, women had to be allowed to participate in the production of scientific knowledge if the violence of modern technologies was to be abated.

Much as women writing in AT magazines had embraced women’s difference, so too did the participants at WLOE. Indeed, one paradox of their ecological organizing was that participants seemed to both embrace a structural critique of environmental devastation and focus on the inherent biological basis of women’s reproduction for their arguments. Influenced by emerging reproductive rights activism and a new scientific consensus on human’s evolutionary place as a natural species, women asserted their reproductive capacities were threatened by

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614 The radical science collective “Science for the People” had long critiqued the political and economic implications of science. Schmalzer and Botelho, Science for the People. Evelyn Keller and Ruth Hubbard were two early scholars examining the relationship between science and gender.

human behavior. As Lois Gibbs explained, women wondered “will my innocent baby have leukemia, or will my daughter ever have a normal pregnancy, a normal baby.” Conference organizers extended women’s biological role, stating that women’s place as “guardian of home and community” meant they were more likely to see health effects “posed by nuclear energy, polluted water, and toxic chemicals.”

As historian Natasha Zaretsky suggests, WLOE took place at a time in which there emerged “a distinct gender politics that combined women’s heightened agency with ecological anxieties about motherhood, reproduction, and species continuity.” At WLOE, both structural and biological understandings of feminist politics were present.

“a) Racist b) Heterosexist ...”: Breaking on the Shoals of Difference

While a central goal of the conference was to set shared feminist, political goals regarding “life on earth,” and some women did find that unity, many women also expressed an underlying sense of fragmentation, especially with regards to what they saw as the white, middle-class bias of the event. As one woman wrote, the event was “a) Racist b) heterosexist ... c) to [sic] country oriented - Didn’t deal with reality of urban [female sign] ... d) Too expensive e) Elitest.” The conveners had specifically planned the conference with diversity in mind, speakers included Katherine Carlotti of Harlem Fight Back, Ramona Peters of the Wampanoag Tribe in Massachusetts, and Paij Bailey, NOW coordinator and civil rights activist in Vermont, yet they still faced the challenge imposed by the very premise of their conference: that there could be a coalition based on the common ground of being women. Even as they declared a

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616 Robertson, The Malthusian Moment.
617 Lois Gibbs, “Opening Speech,” Box 1, WLOE.
618 Women and Ecology Project, “Women and Life on Earth: A Proposal for a Conference,” Box 1, WLOE.
619 Zaretsky, Radiation Nation, 2
620 Conference evaluations, Box 3, WLOE.
collective woman, sameness broke in the face of difference, both in workshops and at the final open mike session.

At the Urban Organizing workshop, panelists described their work for tenants’ rights, community gardens, and urban health. One began her talk saying: “I want to talk about White people organizing in Third World neighborhoods …. I would say that as a White organizer in a predominantly Hispanic and Black neighborhood, the way I can work well there is to connect with people on universal issues - and that’s my own feelings of motherhood.” Another quickly responded: “I think this conference should be called ‘White Women and Life on Earth’. I mean, there were a few Third World women here -- that is a very big disappointment for me.” She reported that “one Black woman said she knew other women who didn’t come here, because they did not like being ‘the only Black ass around...’.” Other women soon joined in this discussion, one adding that she didn’t like that it was all women, while another rejected antinuclear organizing saying “and I think, ‘Fuck it, it is so important because it is the only ‘issue’ that you can’t buy your way out of ...’.” Eventually, the panelists seemed to regain control of the room, one arguing “that we have to address issues that are relevant and controllable by Black women - to participate in what they are doing.”

These same issues – race and class toppling a collective female identity – were raised at the last open mike session when, as reported by Grace Paley and Ynestra King, the need to speak on “ecological urgency and military danger was lost to discussion as one woman after another addressed the fact of racism as a sickness of our society from which those present were not immune.” Or, as Anna Gyorgy wrote, “urban black women brought issues of racism to the

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621 Urban Community Development, Box 1, WLOE.
622 Ynestra King and Grace Paley, “Looking at the Conference,” Women and Life on Earth: Post-conference Mailing No. 1, April 18, 1980, Box 3, WLOE.
attention of the largely rural white conference.\footnote{Anna Gyorgy, “Feminism, Ecology, and the ‘80s,” New Age: 13.} Femininity and motherhood, it seems, could not unite women even at a conference devoted to the unity of women’s experience as biological beings and political actors. Some of the conference evaluations indicate the same. Again and again, participants wrote that the negative aspects of the conference had to do with lack of attention to race. For instance, “There wasn’t enough attention given to the whole sexism racism parallel, and workshops should have had more 3rd world women facilitating.”\footnote{Conference evaluations, Box 3, WLOE.} Another wrote that the most valuable parts of the conference were the “anti-racism workshops [and] the insights of black women,” while still another added that what was “also valuable, but discouraging, was to realize that because a conference is all women it is not free of many of the problems of organizing with men.”\footnote{Conference evaluations, Box 3, WLOE.}

A repudiation of white feminists’ claims of shared femininity has been well covered in scholarly and activist debates. Seminal works by Joan Scott, Kimberle Crenshaw, and Angela Davis, to name just a few, discuss the multiple relationships women live within, breaking “women” into countless identities.\footnote{Scott, \textit{Gender and the Politics of History}; Angela Y. Davis, \textit{Women, Race and Class} (New York: Vintage Books, 1983); Kimberle Crenshaw, “Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color,” \textit{Stanford Law Review} 43, no. 6 (1991).} What I want to emphasize here is not the obvious assumption of a cohesive category “woman” but the ways these individuals’ politics also presented a “whole earth” that was, in fact, not. Ecology, self-sufficiency, and environmental crisis were built, as the previous chapters have shown, out of white, middle-class homes. Black women did not just speak against singular womanhood but against singular domesticity and singular ecologies. They insisted that their homes, their bodies, their economies were materially different due to government politics, institutional economic racism, and cultural beliefs.\footnote{Loyd, \textit{Health Rights Are Civil Rights}.}
Conclusions: “Technology is Controlled by Politics”

By claiming the right to the production of scientific knowledge, technological choice, and technological use, the women who discussed the relationships between feminism, ecology, and technology over the course of the 1970s laid claim to new forms of citizenship. They saw technoscience as a place of male power and sought to gain access to this political realm. They also aimed to overturn conventional technoscientific practices through their feminine difference, whether they saw that difference as biologically innate or historically mediated. These conversations led, pushed by events such as Three Mile Island, to conferences such as WLOE. While organizers of WLOE wanted to find a feminist political identity that would fight “against the economics of the destroyers and the pathology of racist hatred,” attendees confronted them with difference. As feminist political scholar Catriona Sandilands argues, a politics that attempts to create “equivalence … is constantly disrupted by the appearance of difference, the impossibility of achieving a singular standpoint around which to organize resistances. Thus, for a radically democratic political speech, openness to the perpetual appearance of new constitutions of plurality is a founding moment.”

The history of women addressing the relationships between feminism, technoscience, and ecology, especially as embodied at WLOE, speaks to the inability to create a unified feminist politics around protection of life on earth. For, as Rob Nixon put it, the “assault on human life is unevenly universal.” Yet events such as WLOE also represent moments in which people could speak against the notion of equivalence, as women made space for others to express their own relationships to ecological harm and racial injustice. As Grace Paley and Ynestra King wrote in the first mailing after the conference to all participants, “For what may have been the first time,

rural and city women heard their differences and common causes. A number of rural women had never heard urban Black women speak their oppression and anger … Some of us thought we might have begun with a tighter political perspective. If we had, others answered, this variety-disparity would not have been expressed. We wanted to see the politics emerge from the conference.”

The “variety-disparity” presented a moment for new political identities, just as had women’s technoscientific critique that preceded it.

Figure 20. Women’s Pentagon Action Poster. http://www.wloe.org/women-s-pentagon-action.77.0.html

630 Ynestra King and Grace Paley, “Looking at the Conference,” Women and Life on Earth: Post-conference Mailing No. 1, April 18, 1980, Box 3, WLOE
The Women and Life on Earth conference continued on in the form of other WLOE conferences, mailing lists, and on November 16-17, 1980, the Women’s Pentagon Action (WPA, *Figure 20*). At WPA, thousands of women ringed the Pentagon, while some read out their “Unity Statement.” In it, they called out that they had “come here to mourn and rage and defy the Pentagon because it is the workplace of imperial power which threatens us all.” The protesters outlined specific demands: “We have the right to have or to not have children, we do not want gangs of politicians and medical men to say we must be sterilized for the country’s good. … We want to see the pathology of racism ended in our time … We want the uranium left in the earth and the earth given back to the people who tilled it.”

They did not, in this statement, make claims to a specific feminine view of the interlocking issues of nuclear war, forced sterilization, and imperialism, among many others. Rather, as philosopher Catriona Sandilands suggests, “The emphasis in the document is on the democratization of public life so that other perspectives may be revealed.” This may be the case, but it did not stop other feminists from rejecting the politics WPA embodied. As the radical feminist magazine *off our backs* asked, “How does this action and its ideas contribute to chiseling away at the oppression of women?” The article gave a primarily negative review of the action: it argued that WPA focused overly on nurturance, care, and interconnection and, in the process, had not placed enough emphasis on women’s structural oppression.

What should the right emphasis be, though, between feminism, women’s social and economic power, technology, and the environment? Women came up with no singular answer to what the relationship should, or could, be. However, in the process, they created feminist

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technoscientific identities and they also brought their concerns into the public sphere. Rather than see the solution to ecological problems in tools or in domestic care for the earth, they turned to the “democratic uncertainty”\textsuperscript{634} of public speech acts. They insisted, as had Hannah Arendt, that the question of how to use science and technology “cannot be decided by scientific means; it is a political question of the first order and therefore can hardly be left to the decision of professional scientists or professional politicians.”\textsuperscript{635} Or, as the technological activist Jan Zimmerman put it at the conference on “Women and Technology: Deciding What’s Appropriate,” “no matter what the technology, the values are the same, and we’re going to have to be prepared to do battle … technology is controlled by politics.”\textsuperscript{636}

\textsuperscript{634} Sandilands, \textit{The Good-Natured Feminist}, 165.
\textsuperscript{635} Arendt, \textit{The Human Condition}, 3.
CHAPTER 8

CONCLUSION: TECHNOSCIENTIFIC CITIZENSHIP OR ECOLOGICAL DOMESTICITY

When participants from the Women and Life on Earth conference ringed the Pentagon in 1980, they called for government action against the militarism, resource extraction, corporate power, and social inequities that threatened “life on earth.” Nearly 20 years prior, Ursula Franklin and the Voice of Women had demanded the Canadian government take responsibility for the harm radioactive fallout could do to citizens. In both of these social movements, women assumed the political power of technoscientific production. They joined technoscientific citizenship to public debate about threats to all living things. By connecting ideas of ecology to politics, these women made a conceptual shift that the technoscientific theorist Bruno Latour claims “introduce[ed] objects that had not previously belonged to the usual preoccupations of public life. [Ecology] has successfully rescued politics from an overly restrictive definition of the social world. In this sense, political ecology has fully succeeded in changing what is at stake in the public sphere.”

Many histories connect these two feminist movements through a genealogy of women’s anti-militarist and international activism. In contrast, I have explored changing ideas of earth, domesticity, and technoscientific citizenship that separate VOW from WLOE through the lens of the Appropriate Technology movement. When AT emerged in the late 1960s, it took shape as both a critique of conventional technoscience and as a social movement intent on constructing alternative technologies and lifestyles to help people “live lightly on the earth.” Many historians frame AT as a movement that supported technocratic policies that were intended to find a middle

ground between environmental protection and economic growth. Indeed, historian of
technology Carroll Pursell argues that AT went through a “rise and fall” over the course of the
1970s, and by 1980 its ideological base had disintegrated. Amending Pursell’s argument that
AT lost political and social power in the Global North, Steven Macekura suggests that AT did
not dissipate but rather found new life in development projects in the Global South.

In this dissertation, I have suggested that other legacies of the AT movement come into
view when we frame the work through gender and women’s activism. First, AT provided
grounds for an expansion of technoscientific citizenship. AT proponents argued that all people
should have the power to produce technologies. This view of participatory technoscience
allowed women, in particular, to gain access to political and economic power. Additionally, AT
argued that a democratization of technoscience could create technologies that cared for people
and life rather than profits, presenting a solution to the flows of toxic harm that conventional
technologies produced. Women thus embraced AT as a form of antinuclear politics. When
viewed this way, AT did not “fall” or move overseas, but provided the basis for technoscientific
and ecological feminisms which emerged in the early 1980s.

Second, I have suggested that along with technoscientific citizenship, ecological
domesticity was a more enduring legacy of AT than the tools it created. AT constructed specific
practices to care for the earth through care for the home and depicted this ecological domesticity
through white, middle-class, heteronormative domestic practices. This construction of home –
and therefore certain kinds of men and women – facilitated the spread of ecological living into
mainstream culture and assured people that inviting nature into homes would not overturn
existing gendered social hierarchies. If this is true, we need to consider the ways AT produced

638 Macekura, Of Limits and Growth; Trim, “An Ark for the Future.”
639 Pursell, “The Rise and Fall.”
social orders that could be exported along with its technologies in international development plans. Masculine technological innovation and feminine domestic care constituted crucial sites of affective, gendered politics that could be transferred into neocolonial environmentality.

Additionally, the construction of the white, middle-class, heteronormative home as the correct space for caring for ecological well-being could serve as a solution to the ways homes were imagined to be in crisis in the 1970s. Welfare reform, “urban renewal,” Black separatism, and women’s increased participation into the paid workforce led people to worry about the disintegration of family and the destruction of stable homes. Constructing ecological living through white domesticity also could be seen as a counter to these other sources of potential social revolution. Inscribing gendered, racialized domestic care for the planet was another way of managing the potential these other social movements had for threatening the status quo. Put another way, focusing on experiments that re-instated a specific kind of domesticity obscures other social justice efforts that were also integrally about home and environment – just not the correct homes or the correct environments.\footnote{Alexander, \textit{The New Jim Crow}; Loyd, \textit{Health Rights Are Civil Rights}; Premilla Nadasen, “Expanding the Boundaries of the Women’s Movement: Black Feminism and the Struggle for Welfare Rights,” in \textit{No Permanent Waves: Recasting Histories of U.S. Feminism}, ed. Nancy A. Hewitt (New Brunswick, N.J.: Rutgers University Press, 2010); Robert Gioielli, \textit{Environmental Activism and the Urban Crisis: Baltimore, St. Louis, Chicago}, (Philadelphia: Temple University Press, 2014); Zaretsky, \textit{No Direction Home}.}

The calls to live lightly on the earth and the rhetoric of global ecological interdependency hid other ways of imagining collective unity, including common harm caused by Cold War militarization, economic injustice, or lack of political sovereignty and democratic control. As I have shown, many of the women involved in activism for ecological living were also making these claims. But their voices were not the ones that bubbled into popular accounts nor are they
remarked upon by historians who continue to reiterate, though unintentionally, the masculinity of attempts to design with nature and the social hierarchies and injustices it maintains.

What implications does attending to the linked history of technoscientific citizenship and ecological domesticity have for today? Just as in the 1970s, planetary ecology continues to be seen as a crucial material ground for our shared public life. While the “limits to growth” structured debates in the 1970s, today climate change and the Anthropocene have become the earthly concerns of both scholarship and activism. In both cases, fear of possible material collapse, which would provoke social and political crises, structures political debates and frames the ways individuals should act within the public sphere.

Much like the descriptions of the Ark by the popular press, we are still enjoined to take personal responsibility for the earth through our domestic actions. Individuals are told to change lifestyles rather than engage in critical discussions of the specific political, economic, and social historical junctures and inequities that have led to this material circumstance. Thus today, the citizenship imagined by AT has dissipated, replaced by people doing “their bit by conserving energy, taking public transit, recycling waste, growing food, and foregoing flights.” As Aya Kimura contends, “The good neoliberal citizen-subject is someone who is personally responsible and constructive, and female citizens need to navigate carefully to be resourceful and scientifically enlightened.” Or, as feminist political theorist Sherilyn Macgregor argues, we live today in a world in which environmentalist lifestyles are “primarily the private spheres of the market and household. It is symptomatic of the triumph of the ultimate neoliberal subject - the citizen-consumer - that people in the affluent world have internalized the idea that the best

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641 Quotation is from MacGregor, “Only Resist,” 624. Carroll Pursell suggests that AT tools lost their ideological basis in the 1980s. Pursell, “The Rise and Fall.”
642 Kimura, Radiation Brain Moms, 5-6.
way to tackle climate change is through lifestyle change.”

The focus on personal care for the earth continues to make women responsible for ecological devastation. This is a far cry from the technological citizenship of the 1970s, when women claimed the right to technological choice while simultaneously critiquing the systems of power that prevented their full political participation.

In fact, if the ecological domesticity of the 1970s continues, so too does a focus on technological fixes. People looking for solutions to climate change focus on tools and techniques. However, as science studies scholar Myles Lennon argues, today’s calls for infrastructure justice may be built out of specific racial orders, much as were AT solutions.

Alongside trust in technological fixes comes a sense that scientific facts in and of themselves produce public good. This year, signs went up declaring “Honesty, Decency, Science” in the run-up to the 2020 election, unquestioningly connecting scientific practice with moral authority. An alternative sign read “science is real.” People involved in the AT movement would have heartily agreed, while also insisting that technoscience is contingent and full of political power. And if we accept science as a moral authority in public life, we risk further depoliticizing things that Arendt claimed were “political question[s] of the first order and therefore can hardly be left to the decision of professional scientists or professional politicians.”

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646 Kimura, Radiation Brain Moms.
647 Arendt, The Human Condition, 3.
In short, today’s planetary geographic imaginary seems rife with political closures and reifications of specific gender orders. The history traced in this dissertation suggests that such closures may be accompanied by political openings, if people refuse the identities placed upon them and the accompanying limitations to public discourse. As scholars Kevin Hamilton and New O’Gorman point out, for Hannah Arendt politics requires that individuals appear in public and be recognized by others when they do so: “To be a political being, to have a political existence, is to be a being that appears before others in public.”

An environmentalism of technological choice and consumption is inherently conservative if it rests upon metaphors of white, middle-class domesticity to understand the earth. That form of ecological care removes action and people from the public sphere, relegates women to domestic life, and erases alternative forms of homemaking, care, and political discourse that might be used to resolve questions of earthly vulnerability. The home cannot be politically transformative as constructed in Western politics. It is a place of private and individual choice that forecloses the ability to bring concerns to the public sphere of difference, discourse, and government and corporate responsibility.

Arendt saw both the political power held by science and its inability to be political. As she wrote, the “action of the scientists ... lacks the revelatory character of action as well as the ability to produce stories and become historical, which together form the very source from which meaningfulness springs into and illuminates human existence.” Transformative technoscientific citizenship can exist, but only as long as it resides within the sphere of public discourse and debate. We need to create a political world where all people have the ability to

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648 Hamilton and O’Gorman, *Lookout America!* , 263.
appear in public, to have a say in the technological choices that cause them harm, and where all
have the ability to make their own concerns matters of public debate.
ORAL HISTORY INTERVIEWS AND ARCHIVAL SOURCES

Oral History Interviews

Denise Backus, New Alchemy Institute, interview by Emma Schroeder, May 31, 2017
Kate Eldred, New Alchemy Institute, interview by Emma Schroeder, May 31, 2017.
Susan Ervin, New Alchemy Institute, interview by Emma Schroeder, February 24, 2017.
Judy Goldhaft, Planet Drum, November 14, 2019.
Anna Gyorgy, Women and Life on Earth, interview by Emma Schroeder, October 25, 2017.
H. Patricia Hynes, interview by Emma Schroeder, October 31, 2017.
Gretchen Lemke-Santangelo, San Diego Center for Alternative Technology, interview by Emma Schroeder, August 5, 2018
Hilde Maingay, New Alchemy Institute, interview by Emma Schroeder, August 11, 2017
Anne Perkins, solar architect, interview by Emma Schroeder, October 27, 2017.
Christina Rawley, New Alchemy Institute, interview by Emma Schroeder, August 11, 2017.
Micheala Walsh, Rockefeller Brothers Fund, interview by Emma Schroeder, March 2, 2020
Nancy Willis, New Alchemy Institute, interview by Emma Schroeder, December 12, 2017

Also included are interviews conducted by the Voices from a Disused Quarry project. Available at National Centre for Alternative Technology papers, National Library of Wales, Aberystwyth.

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210


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BIOGRAPHY OF THE AUTHOR

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