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Preserving her voice: The Ursula Franklin archive[1]

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Abstract: Here I consider the life and work of Dr. Ursula Martius Franklin, research physicist, metallurgist, pacifist, and feminist, and explore her archival records, deposited at the University of Toronto Archives. We give an overview of Dr. Franklin's achievements and research; her work as a pioneering woman in science, technology, and engineering; and her commitment to pacifism and the social responsibility of the scientist.

Key words: biography, women in science, archaeometry, archives, technology.

Résumé : Nous considérons ici la vie et les travaux de la Dr Ursula Martius Franklin, physicienne chercheure, métallurgiste, pacifiste et féministe, ainsi que ses dossiers déposés aux Archives de l'université de Toronto. Nous présentons un survol de ses réalisations et de sa recherche, son travail de pionnière comme femme en science, technologie et ingénierie, avec son implication comme pacifiste et sa promotion de la responsabilité sociale des scientifiques. [Traduit par la Rédaction]

Mots-clés : biographie, femmes en science, archéométrie, archives, technologie.

Introduction

Dr. Ursula Martius Franklin was a pioneer in many respects: in the field of archaeometry; as a female scholar of science, technology, and engineering; as a visionary in the use of science for social and environmental good; and as a public intellectual who encouraged us to contend with our technological society. For her contributions, Dr. Franklin received more than 25 honorary degrees and countless awards and medals, including the Governor General's Award in Commemoration of the Persons Case, and the Pearson Medal of Peace. She was a Companion of the Order of Canada, a Fellow of the Royal Society of Canada, and an inductee into the Canadian Science and Engineering Hall of Fame. In 1995, the Toronto Board of Education opened Ursula Franklin Academy, an alternative school whose mission she helped to shape.

One year before Dr. Franklin's death, the University of Toronto Archives acquired her archival records and mounted a small exhibition to highlight some of her many achievements [1]. At more than 130 boxes of textual records, photographs, posters, audio cassettes, and video, Ursula Franklin's archives document the breadth of her professional work, political engagement, and private life. Records include correspondence, day planners, notebooks, manuscripts, research notes, travel records, and hundreds of files documenting each talk and seminar she delivered, from prestigious academic conferences to small community gatherings (see Fig. 1).

An individual's private papers provide unique insight into a life: their successes and failures, hopes and frustrations, and joys and worries. As archivist Catherine Hobbs explains, personal archives "contain traces of the individual character of the record's creator. There are here glimpses of the inner soul as well as its outer manifestation in public activities" [2]. Dr. Franklin's archive certainly includes her profound work and thought, but it also documents the ways in which she interrupted the ordinary flow of the status quo with her determination, courage, compassion, and thoughtful critique. Her archive includes more than 10 boxes of meticulously kept files on public lectures and conferences, more than 10 boxes of correspondence, where the personal and professional are tellingly interfiled; and more than eight boxes relating to writing and academic publishing. This is the material that reveals so much about Dr. Franklin: that she could deliver a long address from *very* sparse notes; she could express exasperation with a colleague's misstep in the most loving terms; and despite being so busy, she took care and patience in her correspondence with others.

For someone who spent much of her career looking through a microscope, Dr. Franklin was keenly aware of the bigger picture: the social responsibility of the scientist; the role of both scholar and school in promoting or resisting war; what it means to live in a technological society; and how the technological turn must be accounted for in research, policy, and political action. An analysis of some highlights of the archive reveal the profound impact that Dr. Franklin had on science, politics, academia, and society.

Under the microscope

Some of the earliest, and most moving, material in the archive are Dr. Franklin's letters back home to Germany when she first moved to Canada [3]. After she and her family survived internment during the holocaust (her mother was Jewish), Dr. Franklin resumed her education and received her PhD in physics at the Technical University of Berlin in 1948. She then moved to Canada to begin her career as a postdoctoral fellow at the University of Toronto.

In 1951, she found work as a research fellow at the Ontario Research Foundation (ORF), which conducted research for organizations lacking the equipment and expertise needed to solve their problems. It was here that Dr. Franklin began using microscopic and X-ray images to reveal new information about museum and archaeological objects, as she completed contracts for the Royal Ontario Museum [4]. Early in our meetings, she explained how, for example, the molecular structure could reveal whether a gold bracelet was hammered into shape, or poured into a form. In the

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[1]This paper is part of a special issue to honor Dr. Ursula Franklin.

Fig. 1. Dr. Franklin at the Fate of the Earth, third biennial conference, 1986. University of Toronto Archives. B1996–0004/001P(26). Photo by Robert Del Tredici.

1980s, Dr. Franklin became the director of The Collegium Archaeometricum, an interdisciplinary group of scholars from the University of Toronto and the Royal Ontario Museum engaged in teaching and research in archaeometry, the field she had a hand in pioneering [5].

In 1967, Dr. Franklin left the ORF to join the University of Toronto's Faculty of Engineering and Applied Science as an Associate Professor (1967–1973), and later Full Professor (1973–1987). There, she continued in materials science and metallurgy, as she became fascinated with Chinese black mirrors, bronzes, and pigments. In 1981, she had the opportunity to travel to China for the International Conference of Early Metallurgy. Many of the original papers from this conference have been preserved in the archive, as have travel materials and postcards she collected from the country's museums and historical sites [6].

Dr. Franklin remained close to the museum world, even serving as director of the University's Museum Studies Program from 1987 to 1989 [7]. Her work with the University of Toronto – Museum of Carthage Project, discussed by Dr. Vitali in this special issue, further encouraged the connections between science and the museum [8].

A woman of science

When Dr. Franklin joined U of T as the first female professor in its Department of Metallurgy and Materials Science, the Faculty of Engineering was not particularly welcoming to women. A quick glance at the faculty's student newspaper during this time reveals a dominant discourse: women ought to be objects of either sexual interest or ridicule — but certainly not respected peers [9]. The climate was not much warmer among her colleagues. At the time, Engineering Faculty Council meetings were held in a building Dr. Franklin could not enter. Despite having female faculty on staff, the group continued to meet in Hart House, a recreational facility for male students, which barred women from entering until 1972 [10].

When Dr. Franklin was named University Professor in 1984, only 25 others had received this highest standing in the university. All of them were men [11]. In 2001, she joined several other women in a lawsuit against the university that ended with retroactive pay equity for 60 retired female faculty members [12].

As Dr. Franklin described at the 20th anniversary of the admittance of women to Hart House, those who fought against women's inclusion must have "[seen] themselves called to prevent unspeakable horrors by keeping the 'outs' out, so that the 'ins' can safely graze." And, of course, Dr. Franklin reminds her audience that their work is not done: "While women have been able to open a remarkable number of gates during the past decades, gate keeping as an activity is well and actively pursued" [13].

Dr. Franklin vociferously discouraged such gatekeeping activities among her colleagues. After attending the annual Engineering Week in 1993, she wrote to one of its organizers about a worrying trend:

> In my presentation I observed that throughout the seminars, tours, and lectures offered during Engineering Week, there was no evidence of women engineers. You responded by saying, that you had tried for years to persuade groups like WISE [Women in Science and Engineering] etc to arrange offerings for Engineering Week, but without success. If this was indeed the thrust of your comment, then there seems to be a misunderstanding here. I was not looking for yet another panel on 'Women in Engineering', nor did I expect women engineers to act as hunting dogs to sniff out other women engineers for the program organizers. What I had hoped for was the inclusion of women by their own colleagues in the offerings of Engineering Week. Surely, the profession cannot be as denuded of women as the printed program implies [14].

She ends the letter by suggesting that perhaps the annual event should be postponed until the names of female engineers come readily to the minds of the conference organizers.

Despite the exclusion she experienced, Dr. Franklin never sought to make a cause out of herself or her career. Instead, she worked to ensure a much easier road ahead for her female students. Dr. Franklin's archive reveals the constant work she did — both publicly and privately — to champion women in her profession. In correspondence, she often put forth the names of young women to be celebrated and given opportunities in her stead. Although it no doubt landed her in difficult situations, Dr. Franklin believed her feminism was an asset to her career as a physicist. Her celebration of Maggie Benston in *Canadian Woman Studies* is structured as a letter to a female graduate student. In it, she advises

> ...first and foremost, don't check your feminism at the laboratory door, it is an important layer of the coat of inner security that will protect you from the chilly climate. As your values will be questioned constantly–implicitly and explicitly, you will depend for your sanity on an ongoing rootedness in the women's community.

She continues,

> Take the time to keep involved in women's issues and don't ever believe that you are 'the only woman in...'. Likely you are not, just as I have never been. Wherever men work, there

> are women working, usually for much lower pay. You may well be the only female doctoral student in a particular group, but what about the secretaries, the cleaning staff, the librarians or the technicians? You may link up with them and gain their support and friendship. As you watch over the safety and well being of others, your own will take care of itself and the chilly climate will warm up a bit [15, p.15].

A lifelong commitment to pacifism

Having experienced the horrors of war first hand, Dr. Franklin devoted her life to peace, and she and her husband Fred found a likeminded community among the Quakers. Reflecting back on her life's work, she realized she had been wrestling with

> one fundamental question: 'How can one live and work as a pacifist in the here and now and help to structure a society in which oppression, violence, and wars would diminish and co-operation, equality, and justice would rise?' [16].

For her efforts "at the forefront of critical global issues in the areas of peace and global justice," Dr. Franklin received The Pearson Peace Medal in 2001 [17].

Dr. Franklin's archive includes rich documentation of both local and national work by Quakers to promote peace, including the operation of the Peace Centre on Grindstone Island in the Rideau Lakes; efforts to send medical aid to North Vietnam after U.S. officials blocked American Quakers from doing so; and legal battles to allow conscientious objectors to refuse to pay taxes earmarked for the nation's defence budget [18–20].

At a time when many scientists were finding it lucrative to engage in research for defense, Dr. Franklin used her scientific knowledge, skill, and access to provide empirical data that supported peace efforts. As an early member of Voice of Women (VOW), a group of feminists working for peace, she oversaw efforts to collect and test baby teeth for levels of strontium-90, a radioactive isotope found in fallout from nuclear weapons testing. As chair of its Research Committee, Dr. Franklin organized VOW's 1963 brief to Parliament on fallout monitoring in Canada, leading to the end of atmospheric weapons testing [21].

Dr. Franklin was concerned with the close relationship the university had with defence interests, and critiqued the ways in which external demands could compromise scientific pursuits, especially those that didn't align neatly with government or corporate interests. At a 1993 panel in response to the Royal Society's issue paper on Research in Canadian Universities, she argued that the foundation of good research comes from new ideas and fresh perspectives — not grant funding. This then begs the question

> Does funding by means of highly competitive and targeted grants and contracts prevent or diminish the free and broadly based exchange of ideas? Will this competitive climate contribute to a stifling of the imagination and creativity, particularly among young researchers.

If we accept that

> at the beginning of every research project stands a question: one may wish to ask therefore: Whose questions are being researched at Canadian universities [22]?

Social responsibility of the scientist

In 1988, Dr. Franklin delivered a talk at Simon Fraser University titled "Responsibility in Science: Can it be Taught?". The handbill for the event neatly articulates the predicament of the researcher, and the role of the university, as she saw it:

> In an era of space weapons, genetic engineering and artificial intelligence, scientists and technologists daily make decisions of enormous consequence to millions of people. How well prepared are they to face the ethical and political dilemmas that accompany such choices? Do the routine practices of research for business or government laboratories permit adequate consideration of these problems? Or should this be a task of the university? 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? [23].

Dr. Franklin's papers demonstrate that ensuring one's research serves social and environmental justice requires more than simply choosing a worthy research question and pursuing it doggedly. It also requires a constant speaking up: to secure funding, to disseminate findings, and to ensure one's work is not distorted to serve a different end. It also entails putting political pressure on the university at large, both as individual scholars, and collectively, through groups like Science for Peace [24]. In short, the pursuit requires speaking truth to power.

As a member of the Science Council of Canada, Dr. Franklin chaired the committee that produced the Council's *Report Number 27: Canada as a Conserver Society (1977)*, which charted a new energy future for Canada — one that sought to reduce demands on our energy resources, rather than increasing supply [25]. The recommendations of the committee were controversial, as they prioritized sustainability over business interests, and asked Canadians to make sacrifices to reduce their demands on the system.

When the report suffered substantial changes during a final editing round by the Council, without the approval of the committee, Dr. Franklin made her position clear in a letter to the Executive Director:

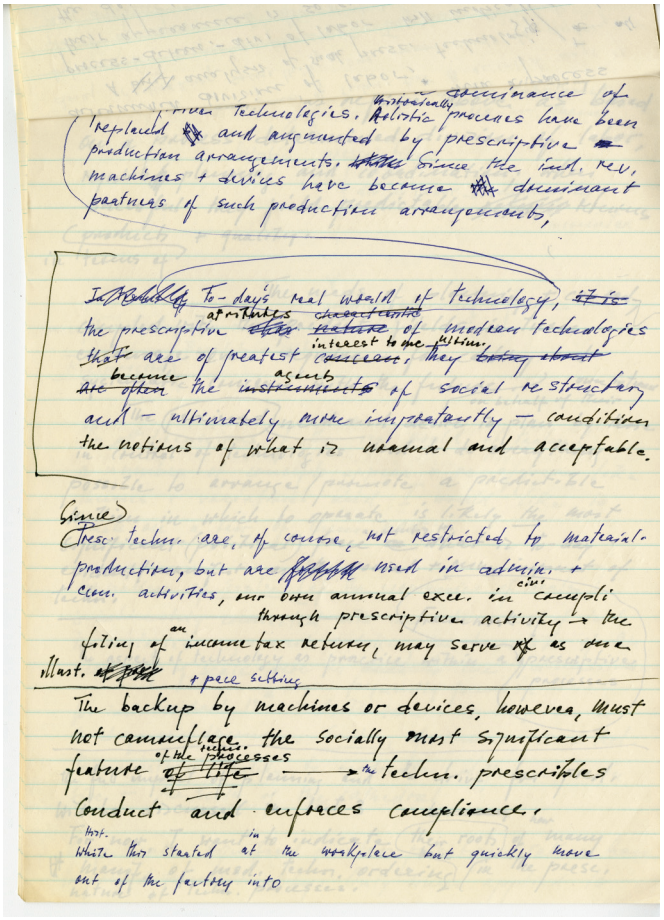
> There is no point in hiding the fact that I am angry. I am writing to you because what is involved here are fundamental matters of policy well beyond the acceptance or non-acceptance of 'editorial suggestions'. What is before me is not an edited version of the draft that the Conserver Committee approved and that was presented to Council. IT IS A DIFFERENT REPORT". She then lays out the substantive changes made to the evidence, arguments, and recommendations of this "drastically altered report," which suddenly seemed focused on satisfying business interests and downplaying of the role of government in providing energy grants. She writes, "To assume that I could agree to 'suggestions' of this type is like assuming that I would report on experiments I have not done, or change results that I did obtain [26].

Dr. Franklin was not one to nod in agreement if she saw fault in an argument or approach. Her critiques seem driven by a love of truth and justice, but they also reveal a deep care for the individuals whom she was trying to drag into the light.

The real world of technology

Like many public intellectuals at the time, Dr. Franklin frequently shared her analysis and insights on the CBC, especially on Max Allen's *Ideas* program. Most notable was the broadcast of Dr. Franklin's 1989 Massey Lectures on "The Real World of Technology" (a nod to the 1964 lectures, "The Real World of Democracy" given by C.B. Macpherson, husband of Franklin's close friend and VOW ally, Kay Macpherson). Her archive contains notes (see Fig. 2), drafts, tapes, and correspondence documenting the evolution of the lectures, which popularized Franklin's theories about technology. Rather than "the sum of the artifacts," Dr. Franklin understood technology as a *system* that shapes our world. Here, we benefit from her scientific understanding of molecular structures, which informs her analysis of the invisible social and political structures that surround us. As Dr. Franklin saw it, "technology has built the houses in which we all live", and so she invites us on a tour of that house — its foundation, walls, storeys and turrets,

Fig. 2. Notes for Dr. Franklin's first Massey Lectures on The Real World of Technology. University of Toronto Archives. B2015–0005/043(10).



secret passages, and trap doors [27]. Dr. Franklin is nothing if not thorough in her analysis. Indeed, the effects of the technological society — and Dr. Franklin's insistence that we come to terms with this reality in research and policy — permeates her writing throughout the archive.

A life in boxes

In 1969, Dr. Franklin returned to Berlin for the first time since leaving in 1949, to attend the World Peace Congress as a VOW representative. In a typed letter distributed among her friends, she writes of her experience:

> I find this very difficult because of the vast mosaic of impressions that engulfed me. Only if I could make a film it would be possible to given even an approximation of what happened because in a way there were four levels of me that operated simultaneously; there I was as a member of the 'Voice of Women' and observer to the Congress. And as such I did and learned certain things; but then there I was as a scientist concerned with peace and the contact with fellow scientists, and this was likely the most successful level if we speak about success in such endeavours. But in addition to that I was there as a Quaker, trying to feel where were the forces of religious concern, of reconciliation, to talk if possible with German friends in East Berlin. But most of all there I was, for the first time in close to 21 years returning to Berlin, where I had lived for twenty five years, where I had gone to school. The city that I knew so well and where most of my formative experiences had taken place. I was born in Munich; but all my schooling took place in Berlin. There I had been during the end of the war. And there I had lived until the blockade, until I finished my education and went to Canada. Never had I gone back, neither to West Germany nor to the East. And there I was for the first time, back in Berlin. All my impressions are essentially a combination of the experiences on those four levels of consciousness; and it is only a very poor approximation to unpeel them in the sequence of words and events which are in fact all interconnected [28].

Dr. Franklin's life and work, multifaceted and cross-disciplinary as it was, poses a challenge for the archivist, who must arrange her material into distinct categories, or archival series. Luckily, Dr. Franklin was never one to withhold her opinions, and she provided guidance on how her life's varied activities might be classified. She was adamant that her archive include copies of her RCMP file: more than 577 pages of surveillance of her political activities from 1949 to 1984. She also insisted that they be filed in the first series of her archive, alongside some of the most important documentation of her family life and career. Even after her death, Dr. Franklin reminds us that her resistance to the status quo was neither a mistake, happenstance, nor a footnote to her life story.

Sifting through those 130 boxes, it is difficult to believe that just one person accomplished so much. Dr. Franklin worked tirelessly to make the world better, and in turn made us better: better scientists, better scholars, better citizens, and better human beings. The University of Toronto Archives is honoured to preserve her legacy, in her own words, by her own hand.

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