

ANGELIKA CLAUSSEN

URANIUM IS ALSO A FEMINIST ISSUE

AROUND THE WORLD, WOMEN ARE RESISTING THE CIVIL AND MILITARY USE OF NUCLEAR TECHNOLOGY

Women have always and everywhere been part of the history of uranium processing and nuclear technology—as workers in uranium production, as residents in the vicinity of mines, or as victims of military and civilian nuclear disasters. Women are particularly vulnerable to the health effects of uranium production because they are twice as sensitive to radiation as men. Indigenous women suffer doubly, because uranium extraction and nuclear weapons testing takes place in large part in (formerly) colonial areas. Resistance against uranium mining and nuclear technology is supported by female doctors, physicists, and journalists all over the world, who raise awareness about the consequences, which are otherwise often whitewashed or inadequately documented. Nevertheless, women’s role in organizing the struggle against nuclear weapons and energy remains extremely underexposed.

Since the development of the first atomic bomb, the military, an overwhelmingly male domain, has been the driving force behind the mining of uranium and its further processing for nuclear weapons and energy. Uranium, which is essential for the chain reaction that takes place in nuclear weapons and power plants, damages and destroys health and the environment because it is both a source of ionizing radiation and chemically toxic. Not only mining, but every link in the nuclear chain leads to serious violations of the human right to life and health: uranium mining, the transport of yellowcake,¹ the civilian use of nuclear energy, the military use of nuclear weapons, the reprocessing of spent fuel rods, and not least the storage of nuclear waste.² Nevertheless, the worldwide exploitation and use of uranium continues to this day. The civilian nuclear industry also serves as a fig leaf for nuclear weapons programmes: states that already possess nuclear weapons, in particular, are currently investing in nuclear energy,³ for which the extraction of uranium is key.

URANIUM MINING FOR THE MILITARY

During the Second World War, the race to build the first atomic bomb took place, involving Germany, Great Britain, the USA, and the Soviet Union. From 1942, under President Franklin Roosevelt, the USA concentrated its research towards the construction of an atomic bomb in the secret military Manhattan Project, led by two men: Robert Oppenheimer, physicist, and Leslie Groves, Lieutenant General—an alliance between natural sciences and the military. In the Soviet Union, too, science, the military, and politics were

male-dominated; under Josef Stalin, the physicist Igor Kurtschatow headed the atomic bomb project there.

Apart from a few exceptions, women played hardly any role in nuclear research and the development of nuclear technology. The most important four can be briefly mentioned here: the physicist Marie Curie investigated the radiation of uranium, and was the first woman to receive the Nobel Prize in Physics in 1903, and the Nobel Prize in Chemistry in 1911. The US-American Chinese physicist Chien-Shiung Wu was involved in the construction of the atomic bomb in the Manhattan Project until 1944, and Maria Goeppert-Mayer, a German who moved to the United States in the 1930s, received the Nobel Prize in Physics in 1963 for her discovery of the nuclear shell structure. The physicist and pacifist Lise Meitner, who contributed significantly to the explanation of nuclear fission at the end of the 1930s, refused to accept research contracts for the construction of the atomic bomb.

Most of the uranium for the US atomic bomb came from the Shinkolobwe mine in what would later become the Democratic Republic of Congo. The working conditions on site were similar to enslavement, and there were hardly any safety precautions. The miners had to transport rocks containing radium and uranium in unprotected bags. The tailings were simply discarded after processing and left behind at the site, despite their radioactivity. This total disregard of radiation protection thus also had health effects on the residents.

Similarly, at Wismut AG in the German Erzgebirge, which from 1946 produced uranium ore exclusively for Soviet atomic bombs, occupational health and safety were at first completely ignored. Miners drilled and blasted dry, which

meant that they were constantly inhaling radioactive dust. In 1948, about 12,000 women were employed by Wismut AG, working above and below ground in the shafts and in ore washing.⁴ In the GDR, there was a blanket taboo on medical studies of the health consequences of uranium production.⁵

HEALTH CONSEQUENCES FOR URANIUM WORKERS AND NEARBY RESIDENTS

The main uranium mining countries are, in descending order of their cumulative production since 1940: Canada, the USA, Kazakhstan (since 1992), Russia (or USSR), Germany (mainly GDR), Australia, South Africa, Niger, Ukraine, Namibia and the Czech Republic.⁶ Much of the uranium has always been mined in areas where indigenous peoples and very poor populations live, who are thus among the main groups affected by uranium production.

By now, numerous medical studies have proven the health consequences for uranium miners, as well as the workers in uranium mills, where the uranium is separated from the extracted ore.⁷ The noble gas radon—a fission product of uranium which occurs in high concentrations in uranium mines, especially underground—causes lung cancer. Mine tailings, both solid and liquid, pose a danger to employees and the local population. A toxic heavy metal, uranium is also chemically poisonous, and can cause lung and bone cancer, as well as leukaemia, kidney damage, and genetic impairments.

It can be assumed that in the immediate vicinity of almost all uranium mines, severely malformed, non-viable infants will be born, and that the risk of cancer is drastically increased. However, neither epidemiological data nor on radioactivity in air and drinking water have so far been systematically collected in uranium mining areas, so concrete figures are missing.

In 2017, US researchers made a start by evaluating data on the health effects of uranium mining on indigenous residents.⁸ In the western US states, exposure data on uranium and other metals and the frequency of occurrence of diseases among the indigenous population were compared with the non-indigenous population. The studies showed that kidney disease, hypertension, and cancer were more common among indigenous groups living near abandoned uranium mines whose radioactive and toxic waste had never been disposed of.⁹

In 2004, a study was published on the health consequences of uranium mining for the community of Jadugoda in the Indian state of Jharkhand. The region is inhabited by members of the Adivasi tribes of Ho and Santhal. The study shows that both children and adults suffer damage due to the increased radiation exposure and the chemical toxicity of the uranium.¹⁰ There have not yet been any follow-up studies collecting individual health data and listing men, women, and children, as would be required for an epidemiological case-control study.

THE “REFERENCE MAN” IS TOO OFTEN THE FOCUS OF RESEARCH

Most large studies on the health consequences of ionizing radiation continuously refer to a reference man between 20 and 65 years old and employed in the production centres of the nuclear industry. The reason for this is that the development of military and civil nuclear technology remains dominated by men to this day. It was only in 2000 that a study was

published showing gender-specific differences in the health effects of radioactivity.¹¹ By now, large radiation protection organizations are cautiously acknowledging that women have about twice the relative risk of tumour formation if exposed to ionizing radiation. Biological mechanisms that could be responsible for these differences are hormonal factors, increased cell division activity in some tissues, as well as sex-linked oncogenes and tumour suppressor genes.¹² Critics also stress the significant potential for damage to unborn life: miscarriages and stillbirths, low birth weight, infant mortality, malformations, mental retardation, Down syndrome, and childhood diseases. However, to this day, the International Commission for Radiation Protection (ICRP) states that no “deterministic harm” is to be expected from prenatal radiation exposure below 100 millisieverts.¹³

The history of the “Radium Girls” clearly shows the disastrous consequences of male-dominated research and its application. From 1917 onwards, women were employed in the “studio” of the US Radium Corporation, to paint the dials of watches with a luminescent pigment. The greenish-white, brightly shining pigment contained only small traces of radium, which, however, soon spread everywhere. Sabin Arnold von Sochocky, an Austrian scientist and co-founder of the company, knew about the dangers of dealing with radium. The mainly male employees working in the laboratory thus had to wear protective clothing, while in the “studio”, no precautions were taken.¹⁴ The assumption that the low concentrations of radium in the fluorescent paint were absolutely harmless was a serious error, as radium 226 is extremely dangerous: most of the “Radium Girls” got radium poisoning and became seriously ill, some fatally.

A good example of how women’s involvement in research makes a difference is that of the first scientist to produce evidence of women and the unborn’s special vulnerability to the use of X-ray radiation in medical imaging. In 1958, Alice Stewart, a British doctor and epidemiologist, found out that children whose mothers had been X-rayed during pregnancy were twice as likely to suffer from leukaemia as other children.¹⁵ Today, too, women in research contribute to broadening the view of the effects of radiation on women. Thus, biologist Mary Olson proved that girls exposed to ionizing radiation have ten times the risk of developing cancer than men.¹⁶

It is therefore time for the international radiation protection bodies to adapt and tighten their recommendations on radiation protection for women. But they show hardly any interest in the matter, and there are no donors who will fund the extensive research that would be required. The ICRP has failed, too, to treat women differently with regard to radiation protection regulations: it claims firstly that the thresholds are so low that additional protection for women is unnecessary; and secondly that discrimination needs to be avoided.

CONSCIOUSNESS RAISING, RESISTANCE, AND SOLUTIONS

After the Second World War, in view of the catastrophic effects of the first atomic bombs, protests against nuclear weapons testing began as part of the peace movement: in the USA, there were protests in 1946 against the two nuclear tests on Bikini Atoll; in Japan in 1954, in response to the Castle Bravo nuclear test, which had radioactively contaminated 23 Japanese sailors who were on a fishing mission; and in Great Britain in 1958, against the British nuclear weapons research centre in Aldermaston.

In 1961, the first major Women Strike for Peace (WSP) marches took place when 50,000 women across 60 US cities protested against nuclear weapons testing. The trigger was the resumption of nuclear tests by the Soviet Union, and the threat of retaliation by the USA. The women rejected their role as passive “concerned mothers” and actively took to the streets demanding peace. Their protest had a significant influence on the Nuclear Test Ban Treaty agreed two years later between the USA and the Soviet Union.

The peace and anti-nuclear movement reached a new peak in the 1980s, with three million people in Western Europe protesting against the stationing of medium-range missiles in East and West. The women’s peace camps on Britain’s Greenham Common and in the German Hunsrück became famous. Protesters occupied the vicinity of missile deployment sites for 19 and 11 years respectively. They invaded military zones by cutting NATO wire fences, disrupting flag consecrations and manoeuvres, and using typically female symbols such as cooking pots or knitting equipment to express their protest. The women in the camps also theoretically discussed feminist analyses of the military, sexism, and patriarchy.¹⁷

In 1989, a group of feminist peace fighters around the sociologist, author, and activist Diane E. H. Russel published a book in which they criticized nuclear weapons and their associated military security dogma from a feminist perspective.¹⁸ The feminists analyzed the connection between masculinity and masculine values in the military system of the nuclear arms race, and examined the language of experts in nuclear defence and security policy. “Trinity”, for example—the Christian theological term for the divine unity between God the Father, Jesus the Son, and the Holy Spirit—was the name given to the first experimental nuclear weapon, and exposes the omnipotence fantasies of its developers. The feminists made clear how nuclear safety experts abstract from the harmful consequences of this technology for nature and human beings, and create an emotional distance by using terms like “nuclear equilibrium” and “nuclear deterrent”. The feminists opposed this with their vision for “positive peace”, invoking the concept developed by Johan Galtung.

In the Ukraine and to a certain extent also in Belarus, the 1986 Chernobyl disaster led to citizen protests and movements that had expert support from journalists, doctors, and biologists. The Ukrainian journalist Alla Yaroshinskaya became known for collecting complaints and information, especially from the female population in the most highly contaminated areas of Ukraine and Belarus. On this basis, she gave the many Chernobyl victims a voice at the first People’s Congress of Deputies in 1989. She showed how the Soviet representatives were colluding with the Western International Atomic Energy Agency (IAEA) to cover up the facts.¹⁹ In 1992, she was awarded the Alternative Nobel Prize for this work. Svetlana Alexijewitsch, a Belarusian journalist who wrote *Chernobyl: A Chronicle of the Future*²⁰ recorded the voices of affected people and condensed them into literary form.

Another example of resistance and solutions can be seen in the initiative of residents of Schönau in the Black Forest, focussed around a married couple, the Sladeks. As an answer to the Chernobyl catastrophe, they founded the EWS Schönau, a municipal energy cooperative that produces eco-power and biogas.

1998 was remarkable for the eight-month, non-violent blockade of the Jabiluka uranium mine in Kakadu National Park in northern Australia. The blockade was made possible by an alliance between national and international anti-nuclear activists and the Mirrar Aborigines, led by Yvonne Margarula.²¹ At the time of the blockade, the Ranger mine had already been in operation in the area for 20 years and had produced a lot of radioactive and toxic waste. The protest, in which 5,000 people took part, was successful, and development of the Jabiluka mine was stopped.

The widespread anti-nuclear protests in Japan following the Fukushima disaster of 2011 are still being carried by women, mothers in particular, who are thereby also resisting Japan’s patriarchally structured society. These women are the ones who organize uncontaminated food for their children. Here, too, female scientists and lawyers are very active and sometimes successful: of 39 nuclear power plants, only nine reactors have been put back into operation so far.²²

In today’s fight against nuclear technology, the indigenous women Charmaine White Face and Leona Morgan deserve special mention. The former is a member of the Oglala Sioux Nation, and an educator and activist for the disposal of nuclear waste from abandoned uranium mines.²³ Leona Morgan is the coordinator of the grass-roots movement Eastern Navajo Diné Against Uranium Mining (ENDAUM) and is committed to the closure of uranium mines and against nuclear waste storage.²⁴ Tens of thousands of people in the land of the Diné, the largest indigenous reserve in the United States, have no access to clean water due to extensive uranium mining and mines that are often abandoned without remediation.

Vandana Shiva, in India, can be seen as an advocate for the connection of people with the natural world around them. The nuclear physicist, philosopher, and environmental activist initially worked as a nuclear engineer. But when she had to answer the question of whether she was aware of the health risks of ionizing radiation with a “no”, she turned away from the nuclear industry. She makes it clear that the human right to life and health not only requires an end to nuclear energy, but also a renunciation of nuclear weapons and hence a new peace policy.

URANIUM MUST REMAIN IN THE GROUND!

Every link in the nuclear chain causes irreparable damage to the environment and to human health. Millions of people worldwide suffer from the consequences of the civil and military nuclear industries, which are two sides of the same coin. The feminine perspective, which stresses the human right to life and health, and the indigenous perspective, which emphasizes a life in harmony with nature, are the driving forces to halt this destruction.

Consciousness raising and resistance against life-hostile technologies—long since performed and promoted by many women—in conjunction with concrete proposals to save our planet and humanity are extremely powerful. Not least thanks to strong women like Vandana Shiva: when she understood that nuclear technology was destroying the foundations of life, she devoted all of her intellectual strength to protecting the earth.²⁵

Humanity is currently experiencing two crises that jeopardize its survival on our planet: (1) The threat of climate change must finally be taken seriously, and the political will is needed to respond with concrete steps and measures for a rapid socio-ecological transformation. (2) The existing

threat of a nuclear war that would destroy life on a planetary scale has become topical again. A renunciation of nuclear weapons and nuclear energy is imperative.

Women in particular play an essential role both in the climate movement and in the anti-nuclear movement. It will be up to the women to bring these struggles together in solidarity, and to patiently and persistently fight for the protection of our planet, together with the many men. Intelligence and humour, perseverance and solidarity will accompany us.

Angelika Claußen is a psychiatrist and psychotherapist. She is also involved in the Organization of International Physicians for the Prevention of Nuclear War—Doctors in Social Responsibility (IPPNW), where she represents the European IPPNW Sections as their Vice President.

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