

## Marie Curie

1867 - 1934

### AMAZING PERSON IMAGE (MA TO FIX)

My mother suffered tuberculosis, and died when I was 12 years old. I saw what the continual coughing and gradual decline did to her. There was no cure, but it set me to thinking if I could make a contribution to save others.

My parents registered my name as Maria Salomea Skłodowska. I was their youngest of five children, born at the Freta Street Boarding School. The apartment was part of my mother's salary, as the Principal. We lived in Warsaw, Poland, at that time occupied by the Russians. My mother, a musician, and my father, a mathematician, were both patriots. Father had lost his job as a teacher, and we had to take in boarders to pay the bills. Living in humble circumstances, we wanted our freedom. For me, it came by way of science, an unusual activity for a girl in those days.

My cousin, Jozef Boguski, who ran the Museum of Industry and Agriculture in Warsaw, encouraged my interest in science. I did my practical scientific training and experiments there. In Poland, access to university education in science was limited, and there were no places for females. However, there was an underground 'Floating University', that moved from one house to another, sharing knowledge in a network of people teaching each other.

To progress, it was necessary to go to another country. My sister, Bronislawa, had left to study in Paris. To assist her, I worked as a governess and sent her some money. At first I worked with a lawyer's family in Kraków, then for two years in Ciechanów where I fell in love with Kazimierz Zorawski, the son of a relative. We wanted to marry, but his family disapproved due to my being poor. So, I moved to Sopot in the north of Poland. For a year, I was governess to the Fuchs family, working by day, studying by night, and earning the minimum. In the meantime, my sister married and invited me to Paris.

At the age of 24, I went to live with her before renting a garret. Eventually, I gained entrance to Sorbonne University; it was the start of my advanced studies in science. I studied by day and tutored by night, eventually qualifying in Mathematics during 1894. Later I gained work at the Lippmann Institute. Living in poor conditions, it was very hard work in an unfamiliar country, with an unfamiliar language. Yet, I was determined to succeed.



Crystallography and magnetism were my initial interests. I was also drawn by the magnetism of a quiet, rather shy, tutor by the name of Pierre Curie. He encouraged me to study the energy in iron ore, by trying to isolate radioactive substances. To do so required toiling over a giant vat of molten iron ore. The substances in the vat gave off a poisonous gas.

Through our interest in science, we talked about research. The more we talked, the more I liked Pierre, and a chemistry of a different kind from that of our research developed. A union of hearts, not just heads. Before long, we were engaged and married in 1895; the start of a scientific partnership. Pierre was 36 years of age and I was 28, as we both found happiness, after years in the wilderness of lonely endeavour.

Within a short time, I realized that I was pregnant and our daughter Irene was born in 1897. That was the year I gained my doctorate in Physics - head and heart, science and family, *tout ensemble*. We had the energy and ideas to pursue science into new areas, working in what a colleague described as 'a stable or potato cellar', where the temperature in winter fell below zero.

We searched for the frontier of radioactivity. Others were doing the same, and in 1896 Becquerel accidentally discovered radioactivity. Our studies built on this through interesting applications. 'Pitchblende' does not sound too exciting, but, working with it, I saw the future. Radium and polonium were detected in 1898, the latter named by me after Poland. This was magic material, but what could we do with it? More experiments showed it was powerful on human skin problems. Radium was used to burn off cancers and 'Curie therapy' was the popular name given to the treatment.

Work with Debierne, another colleague, and my husband, continued and pure radium was discovered. I was awarded the Nobel Prize in 1903, which was shared with Pierre and Becquerel, for their contributions. We used the money to support more research and help students. Radioactivity was not a chemical, but the property of an atom - nature's gift, if only we could harness it.

Sadly, I had a miscarriage in 1903. Fortunately, after recovery, our daughter Eve was born in 1904. But, disaster struck in 1906 when Pierre was killed by a horse in a freak accident. As a single mother of two children, I was distraught. Sorbonne University offered me Pierre's position and as the first female Professor, I continued his work. Alas, the French Science Academy ignored my work. Sexism and being Polish, I think, outweighed scientific discoveries.

For a long time after Pierre's death, I was in shock. As a single mother, I tried to balance work and family life, which was not easy. Through my work I got to know Paul Langevin, a fellow scientist who had been a student of Pierre's. In my dark days, his support helped me through and gradually our relationship became more than platonic. Paul was five years younger than me. In 1910, he left his wife and we had a relationship. People in the science community knew, and the gossip developed into a so-called scandal, which is hard to believe in Paris, where an affair was *de rigueur*.



Nonetheless, I was awarded a second Nobel Prize for chemistry in 1911, for measuring the atomic weight of radium. My work on radioactivity and X-rays continued. During the First World War, X-rays were used to assess serious injuries. With my daughter Irene, I set up X-ray vans and trained 150 radiographers. Those were dreadful days, seeing the effects of the bombing and shooting whilst trying to save our valiant soldiers against the German invaders.

After the war, recognition for my work came from the USA. Also travelling to many countries to encourage scientists became very important. My discoveries were not patented for self-gain since we needed as many people as possible to help advance the boundaries of curing illness with radiotherapy treatments. Thus reducing pain and suffering, extending people's lives and other uses.

I helped establish the Radium Institute in Paris during 1914, with another to follow in Warsaw in 1932. My sister Bronislawka became its founding director. In addition, my daughter Irene became a scientist and won the Nobel Prize for artificial radioactivity in 1935. This marked an achievement of which Pierre would be proud and represented the progress for which so many gave their lives; working with radioactive dangerous materials and developing the forces of nature to help improve people's lives.

*En route*, I was a mother, scientist, teacher and technical specialist. I also worked in managerial and other roles.

All part of a life that opened up new avenues for mankind.

