

Women

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By Suresh Menon

Of the 513 Nobel winners in the sciences, only 11 have been women. Why?

JAMES Watson begins his book about the discovery of the structure of the DNA, *The Double Helix*, with the story of a holiday meeting with Willy Seeds, a scientist who, rather than stop and speak to Watson, merely asks, "How 217;s honest Jim?" and walks on. Seeds was being sarcastic. Two years earlier, Watson had helped himself to other people's data - notably those of Rosalind Franklin, without permission or acknowledgement - to arrive at his Nobel-winning conclusion. In her excellent biography of Franklin, *The Dark Lady of the DNA*, Brenda Maddox wrote: "Rosalind Franklin has become the symbol of women's lowly position in the pantheon of science."

There have been 513 winners of the Nobel Prize in the sciences (physics, chemistry, medicine). Only 11, or about two per cent, have been women. Yet women scientists have pushed the frontiers of knowledge just as hard and with just as much determination as the men; for their efforts, they invariably brought fame and glory to the men they worked with. Jocelyn Bell was the astronomer who discovered pulsars, energy emissions constituting a new class of stars; the Nobel Prize went to her professor for "recognising the meaning" of her work.

Discrimination: Gerty Cori, who studied carbohydrate metabolism,

enzymes, and children's diseases caused by enzyme deficiencies, did not become a professor until the year she won a Nobel Prize. Maria Goeppert Mayer, who developed the shell model of the atomic nucleus, worked as a volunteer for years. She was the last woman recipient of the physics Nobel, back in 1963. For years, great scientists like Marie Curie, Lise Meitner, Emma Noether (who provided the

into the hall upstairs and hid under the chairs to listen to lectures.

Yet a decade later, she had become the director of a centre for radiation physics, and an important figure in the world of science. After fleeing Nazi exile, she was 60 when she deciphered what many considered the "experiment of the century". She was the first to recognise that the nucleus of an atom could be split releasing enormous

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mathematical base for Einstein's theories and invented a whole new field, abstract algebra) worked without salaries or designations at universities.

Lise Meitner had to use a private entrance to a carpentry shop in the basement of Berlin's chemistry institute where she worked on her radiation experiments. She wasn't allowed to use a toilet in the building and had to go to a hotel nearby. Occasionally she sneaked

amounts of energy. For this path-breaking work (which heralded the dawn of modernity in physics), her German partner, Otto Hahn, was awarded the Nobel Prize.

"Hahn and Meitner were great friends; but when they talked, she was superior. For me, she is really a great scientist," wrote the 1989 physics Nobel winner Wolfgang Paul (not to be confused with the 1945 winner Wolfgang

Are the women?

Pauli).

Meitner's prayer might have been the unsung anthem of the unsung women: "Life need not be easy, provided only that it is not empty."

Women who did win the Nobel didn't have a smooth ride either. Barbara McClintock, initiator of what Stephen Jay Gould called a revolution in genetics with her discovery of transposable elements in maize, was told by the University of Missouri's botany department, "If you get married, you'll be fired." Her work, says Gould, was the beginning of molecular genetics and she suffered the fate of many pioneers - incomprehension and bewilderment from colleagues who could not read her maps of terra incognita." Told that she would never get on the University's permanent staff she packed her belongings into her car and drove off, playfully toying with the idea of becoming a weather forecaster.

Barbara McClintock was 81 when Nobel recognition finally came to her. "It's a good thing it happened so late in life," she said, otherwise it would have interfered with her work. When she was elected to the National Academy of Sciences in America, she made the only implicit reference, according to her biographer, to the problem of women scientists: "I was stunned. Jews, Negroes and women are accustomed to discrimination and don't expect much. I am always gratified when illogical barriers are broken. It helps all of us."

In her book on the lives of the Nobel prize women in science, written nearly a

decade and a half ago, Sharon Bertsch McGrayne divides the scientists into two generations. The pioneers like Marie Curie and Lise Meitner who came of age just as European universities opened their doors to women and whose formative years spanned the first women's movement. The second coming, occurred in the 1960s and 1970s, saw Nobel-worthy research from the likes of Cori, McClintock, Dorothy

Bell's discovery opened up the field, with implications in relativity, gravitation and superdense matter. Yet, once the interviews were done, and the last of the pictures taken, Bell married and turned her back on radioastronomy. Her thesis adviser Anthony Hewish won the Nobel.

Bell first helped Hewish build an enormous radio telescope (it stretched over 4.5 acres and took two years to

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Hodgkin, Goeppert Mayer, Franklin, and Jocelyn Bell.

Bell was 24 when she discovered pulsars. As McGrayne writes, "When reporters learned that Little Green Men from outer space and an attractive young woman were involved in the most dramatic scientific event of the decade, they headed straight for Bell. She would provide a soupcon of sex and excitement to spice up an already delectable story."

build). Then she was put in charge of analysing its data that covered 100 feet of chart paper everyday. Bell struggled to keep the analysis moving parallel to the data. In six months she was buried under three and a half miles of paper.

She had to distinguish between the familiar (background interferences like aircraft transmissions) and the potentially significant. "The temptation to cut corners on analysis must have

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been considerable," wrote a scientist later. When she spotted a "bit of scruff" it was a mere half inch on 400 feet of chart, but it intrigued Bell and led to the discovery of pulsars, unimaginably dense neutron stars only 10 or so kilometres across, whose existence had been theoretically predicted three decades earlier.

Work and credit: Hewish won the Nobel in 1974 for "his decisive role in the discovery of pulsars". The astronomer Fred Hoyle said Hewish had "pinched" the Nobel by not giving Jocelyn Bell proper credit. This started a joke that Nobel means "No Bell". Bell had the modesty to say that this was "preposterous", and that "her background in astronomy wasn't as good as Hewish's" and she "didn't appreciate all the risks". Later, it turned out that at least one other astronomer had seen the same bit of scruff as Bell had, but had not followed it up with her tenacity and open mindedness.

Frieda Robscheit-Robbins worked with George Whipple on a cure for pernicious anaemia - work for which Whipple alone won the Nobel in 1934. Perhaps she summed it up best when she said, "You become possessed of a magnificent obsession and determination to learn the truth of your scientific theory if it takes 16 years or many times 16. If you are successful, you really deserve no great credit, for by that time experiment has become the only thing in life you care to do."

A noble sentiment, if not a Nobel one. COURTESY THE HINDU