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Anna Mani: The Weather Woman of India

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Anna Mani: The Weather Woman of India

How did a scientist denied a PhD give India its own weather instruments? Anna Mani trained under C. V. Raman. Then she built the instruments that India's weather service used for decades.

1 Who was Anna Mani?

Anna Mani was an Indian physicist and meteorologist. People call her the Weather Woman of India.

Where did she come from?



Oil painting of Anna Mani by Rajasekharan Parameswaran. Photo: CC BY-SA 4.0, via Wikimedia Commons. Resized.

- She was born on 23 August 1918 in Peerumedu, in the Western Ghats of Travancore.
- Her father was an engineer with the Travancore Public Works Department.
- Her mother was a teacher.
- She was the seventh of eight children.
- Her father taught her to accept a claim only after testing it herself.
- She earned an honours degree in physics and chemistry at Presidency College, Madras.

What is the memory hook?

Think “test it yourself”. Her father’s rule shaped her life as a scientist.

> **Quick check 1.** Anna Mani was born in Peerumedu in the Western Ghats of Travancore. *(True or False?)* See answer ↓

Sources: insaindia.res.in; wmo.int

2 What happened with Raman and her PhD?

She researched in C. V. Raman’s lab at IISc. Her PhD was refused because she had no master’s degree.

What did she research?

- She joined the Indian Institute of Science, Bangalore, in 1940.
- She worked in the physics department headed by C. V. Raman.
- Her first paper came out in 1942.
- She studied the light given out by rubies and diamonds.
- She wrote five research papers.

Why did she not get the degree?

- She submitted a PhD dissertation to Madras University in 1945.
- The university said she had no MSc.
- So it did not grant her the PhD.

What is the memory hook?

Think “five papers, no PhD”. The rule stopped her, not her science.

> **Quick check 2.** Madras University granted Anna Mani a PhD in 1945. *(True or False?)* See answer ↓

Sources: insaindia.res.in; thebetterindia.com; stemettes.org

3 Where did she train, and what came next?

She trained in weather instruments in Britain. She came home in 1948 and joined the weather service.

What did she do abroad?

- The Government of India gave her a scholarship.
- She went to England on a troop ship.
- She spent three years there.
- The British Meteorological Office trained her on weather instruments.
- She spent three months at the National Physical Laboratory, Teddington, learning about standards.

What did she do on her return?

- She returned to India in 1948.

- She joined the Instrument Division of the India Meteorological Department (IMD) at Pune.

What is the memory hook?

Think “England, then Pune 1948”. The training led straight to the job.

> **Quick check 3.** She trained in weather instruments in England before joining the IMD. *(True or False?)* See answer ↓

Sources: insaindia.res.in; wmo.int; stemettes.org

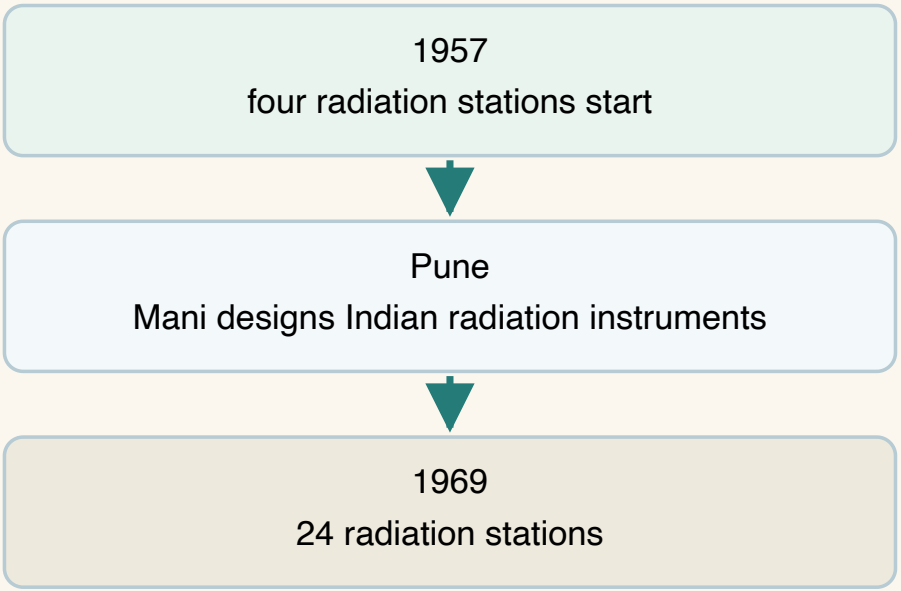
4 How did she make India self-reliant in instruments?

She designed and standardised nearly one hundred weather instruments. Imports of surface instruments stopped within five years.

What did she build?

- Her first job was a recording rain gauge.
- Then came the hygrograph, thermograph, barograph and anemograph.
- She wrote specifications, drawings and manuals for each one.
- Imports of all surface instruments stopped in five years.

How did she study sunlight?



Four stations grew to 24. Original explanatory diagram.

- The International Geophysical Year ran in 1957 and 1958.
- India started four radiation stations in 1957.
- She then designed Indian radiation instruments at Pune.
- The first was the pyrheliometer, then the pyranometer.
- By 1969 India had 24 radiation stations.
- The WMO recognised Pune as a Regional Radiation Centre for Asia.

What is the memory hook?

Think “100 instruments, 24 stations”. One number is for tools and one is for sunlight.

Quick check 4. Her first job at the IMD was to design a recording rain gauge. *(True or False?)* See answer ↓

Sources: insaindia.res.in; thebetterindia.com; wmo.int

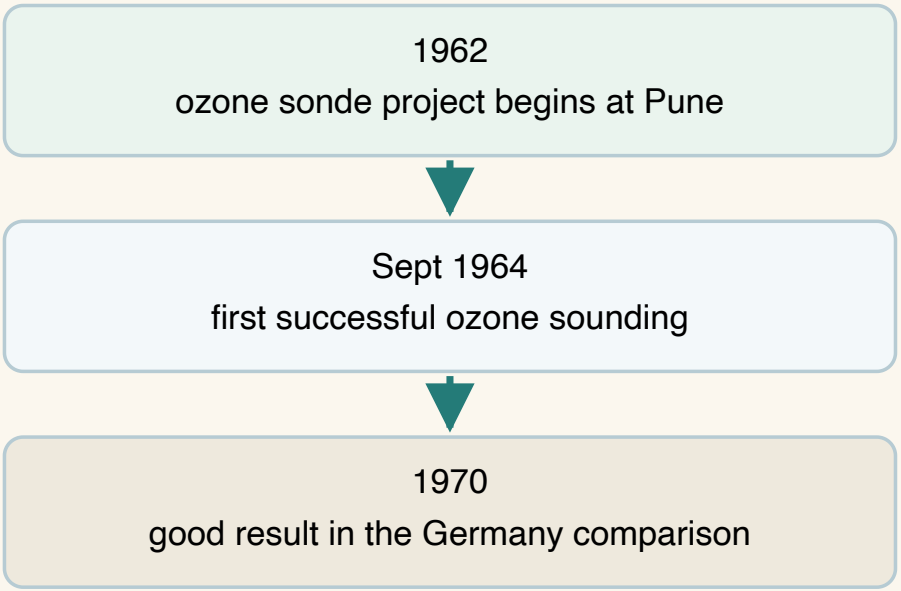
5 How did she measure ozone?

She built India's ozone sonde. It is a balloon instrument that measures ozone high in the air.

How did the sonde work?

- K. R. Ramanathan urged her to develop an Indian ozone sonde.
- She began the project at Pune in 1962.
- A balloon carried it up.
- A small pump sucked air through a potassium iodide solution.
- The ozone changed the solution and made a weak electric signal.
- The first successful ozone sounding from Pune came in September 1964.

Why did it matter?



From project to proof. Original explanatory diagram.

- The sonde did well in an international comparison in Germany in 1970.
- Indian ozone soundings were routine on Antarctic expeditions from 1982.
- They showed the ozone hole over Antarctica.

What is the memory hook?

Think “1962 start, 1964 first sounding”. Two years of failures came between them.

> **Quick check 5.** The first successful ozone sounding from Pune came in 1962. *(True or False?)* See answer ↓

Sources: insaindia.res.in; thebetterindia.com

6 What did she do later, and what honours came?

She became a Deputy Director General and retired in 1976. Then she turned to solar and wind energy.

What posts and projects followed?



Statue of Anna Mani. Photo: Salil Kumar Mukherjee, CC BY-SA 4.0, via Wikimedia Commons. Resized.

- She moved to Delhi in 1969 as Deputy Director General for instruments.
- She retired from the IMD in 1976.
- She joined the Raman Research Institute as visiting professor for three years.
- Her books on solar radiation came out in 1980 and 1981.
- In 1984 she started a wind energy survey for India.
- It grew to about 150 stations by 1996.

Which honours and facts should you know?

- She became a Fellow of the Indian National Science Academy in 1977.
- She received the INSA K. R. Ramanathan Medal in 1987.
- She had a stroke in 1994.
- She died on 16 August 2001 in Thiruvananthapuram, aged 82.

What is the memory hook?

Think “retired 1976, wind survey 1984”. Her work did not stop when she left the IMD.

> **Quick check 6.** She retired from the IMD in 1976. *(True or False?)*
>
> See answer ↓

Sources: insaindia.res.in; wmo.int; thebetterindia.com

7 What are the common exam traps?

Four mix-ups come up again and again. Learn each pair.

What are the traps?

- **PhD:** She never received a PhD. Madras University refused it because she had no MSc.
- **Training:** She trained in Britain, in meteorological instruments, not in physics.
- **Which year?** She joined the IMD in 1948 and retired in 1976.
- **Sonde:** The first successful ozone sounding was in 1964. The project began in 1962.

How do you remember them?

Think “no PhD, 1948 to 1976, ozone 1964”. Match each fact to its number.

> **Quick check 7.** Her wind energy survey began in 1984. *(True or False?)* See answer ↓

Sources: insaindia.res.in; stemettes.org

Practice MCQs

1. Anna Mani is popularly known by which title, for her decades of work on weather instruments?

A. The Weather Woman of India

B. The First Lady of Indian Science

C. India's Rain Queen

D. Mother of Indian Meteorology

See answer ↓

2. Why did Madras University not grant Anna Mani a PhD for her 1945 dissertation?

A. Her thesis was not submitted in time

B. C. V. Raman withdrew his support

C. She had no master's degree

D. She was a foreign student

See answer ↓

3. Where did Anna Mani join the India Meteorological Department in 1948?

A. Instrument Division, Pune

B. Observatory, Colaba

C. Regional Centre, Nagpur

D. Headquarters, Delhi

See answer ↓

4. Which instrument did Anna Mani build to measure ozone high in the air, with its first successful sounding in September 1964?

A. Hygrograph

B. Pyrheliometer

C. Anemograph

D. Ozone sonde

See answer ↓

5. In which year did Anna Mani retire from the India Meteorological Department?

A. 1969

B. 1976

C. 1984

D. 1987

See answer ↓

Answer Key

1. **A.** The answer is The Weather Woman of India. Anna Mani designed and standardised nearly one hundred weather instruments at the India Meteorological Department. Imports of surface instruments stopped within five years. The other titles are not linked to her in our sources. Memory hook: instruments made her the Weather Woman. ↑ Q1
2. **C.** The answer is that she had no master's degree. She had an honours degree in physics and chemistry. She had also written five research papers under C. V. Raman. The other reasons are not given by any source. Memory hook: five papers, no MSc, no PhD. ↑ Q2
3. **A.** The answer is the Instrument Division at Pune. She had trained in England on weather instruments. She moved to Delhi only in 1969, as Deputy Director General. Memory hook: Pune 1948, Delhi 1969. ↑ Q3
4. **D.** The answer is the ozone sonde. A balloon carried it up. The pyrheliometer measures sunlight. The anemograph measures wind and the hygrograph measures humidity. Memory hook: sonde means sounding. ↑ Q4
5. **B.** The answer is 1976. She had been Deputy Director General since 1969. After retiring she joined the Raman Research Institute. Her wind energy survey began in 1984. Memory hook: retired 1976, wind survey 1984. ↑ Q5

Quick-check answers

1. **True.** She was born there in 1918. ↑ 1
2. **False.** it is false. It refused because she had no MSc. ↑ 2
3. **True.** She came home in 1948. ↑ 3
4. **True.** Other instruments followed. ↑ 4
5. **False.** it is false. 1962 was when the project began. The sounding came in 1964. ↑ 5
6. **True.** She then turned to solar and wind energy. ↑ 6
7. **True.** It grew to about 150 stations by 1996. ↑ 7

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