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ENGLISH

CHAPTER 6: THE MAKING OF SCIENTIST



THE MAKING OF SCIENTIST

~Summary~

-by Robert W Peterson

Richard's Success at Young Age

The article of Richard and his friend was published in the scientific journal 'Proceedings of the National Academy of Science'. He was only twenty two years old at that time. It was the first time that the research work of college students was published. It was a rare honour for Richard.

Richard-A Collector from Childhood

Richard was the only child of his parents. He grew up at Reading in Pennsylvania, USA. He had no one to play with. So, he started collecting things like rocks, fossils and coins. Gazing at stars and collecting butterflies were his hobbies.

Richard's Mother—His Companion

Richard's mother was constantly with him. She encouraged him by taking him on trips and bought him telescopes and other equipment. She found work to challenge him and helped him to learn a lot.

Richard Reads 'The Travels of Monarch X'

The reading of a children's book titled 'The Travels of Monarch X' inspired him. He became interested in the world of science. The book asked the readers to study butterfly migrations. Richard came in contact with the scientist Dr Urquhart through this book, who influenced him greatly.

Richard Raises Monarch Butterflies

Richard decided to raise butterflies at home to study their migration pattern. He would catch a female monarch and take her eggs. He would watch all the stages of development of the butterfly. Then he would tag their wings and free them. He did it for many years and raised thousands of butterflies in the basement of his home.

Richard Enters County Science Fair

Richard displayed his slides of frogs at the county science fair, but did not win any award. He realised that he needed to carry out real experiments to win an award. He took suggestions from Dr Urquhart. As a result of his many experiments, he won many prizes at the county and international science fairs in the following years.

Richard's Eighth Grade Project

Richard tried to find the cause of a viral fever that kills thousands of monarch butterflies. He thought that a beetle may carry the virus that causes viral fever. Although this was not the case, he still won a prize for his project.

Richard's Win at County Science Fair

Richard experimented on viceroy butterflies. He tried to prove that viceroys copy monarchs. Viceroys do it to protect themselves from birds as birds don't eat monarchs. The project won the first prize in the Zoology division and overall third prize in the county science fair.

Richard's Discovery of a Hormone

Richard was curious to know the reason behind twelve gold spots on a monarch pupa. He and his friends built a device to prove that the spots were producing a hormone necessary for its full development. The project got him first prize in the county fair. He also entered the International Science and Engineering Fair. He got third prize for Zoology in this fair.

Richard Continues his Research on Monarch Pupa

Richard grew cells from the wings of a monarch butterfly. He further proved that cells grow into scales of wings only when they are injected with the hormone from the gold spots. He carried on his work at the Army laboratory and laboratory of the US Department of Agriculture. After his freshman year at Harvard, he returned to the laboratory of the Department of Agriculture to identify the chemical structure of hormone. This gave him a new idea about cell life.

Richard's Study of Cell and DNA

Richard's research on the hormone gave him an idea. He believed that his study could tell how cells read their DNA. He, along with his college roommate, James R Wong, worked on the idea. Then, they wrote a paper explaining their theory.

Richard's Glory at Harvard

Richard graduated with second position in a class of 1510 students. He became a graduate student researcher. He started experimenting to prove his new theory. His theory may create new ways to prevent some types of cancer and other diseases.

Richard—An All-Rounder

Richard was not just a scientist. He was an allrounder. He was a good debater and a public speaker. He was also a photographer and an outdoors-person. His social studies teacher praised him for his will to work hard, do his best and win.

Richard—A True Scientist

Richard had all qualities that made him a true scientist. He had curiosity and a first rate mind. He wanted to win for the right reasons.

Conclusion of The Making of a Scientist

In the chapter – The Making of a Scientist teaches perseverant and dedicated towards our work. This will help us achieve our dreams and would bear the fruits of our labour some day, sooner or later.

NCERT SOLUTION

Questions (Page No. 32)

(READ AND FIND OUT)

Question 1: How did a book become a turning point in Richard Ebright's life?

Answer: Richard Ebright had a deep fascination of collecting butterflies of different species. By the time he was in the second grade, Ebright had collected all twenty five species of butterflies found around his hometown. That was probably the end of butterfly collecting for him. Then, his mother brought him a children's book 'The Travels of Monarch X' which explained how monarch butterflies migrated to Central America and this book opened the world of science for Richard. After reading the book, he found a lot of interest in tracking the migration of butterflies. This deep interest led him to work on several other projects and experiments on the Monarch butterflies. Thus, the book became a major turning point in Richard Ebright's life and he became a renowned scientist.

Question 2: How did his mother help him?

Answer: Richard's mother always helped him by encouraging his interest to learn new things. She took him on occasional trips and bought scientific equipment for him such as telescopes, microscopes, cameras, mounting materials and other related equipment and tried helping him in every possible way. If he didn't have anything to do, she found new learning things for him. She helped him through different ways, both directly and indirectly. She even gifted him the book 'The Travels of Monarch X' which proved a major turning point in Richard's life and motivated him to become a great scientist.

Questions (Page No. 34)

(READ AND FIND OUT)

Question 1: What lesson does Ebright learn when he does not win anything at a science fair?

Answer: Ebright's entry at a science fair was with slides of frog tissues, which he showed under a microscope. He did not win any prize for his display. He understood that to win in such a science competition, it was important for him to conduct real experiments, not simply make a neat display. Thereafter, he started working on various projects and conducted real experiments.

Question 2: What experiments and projects does he then undertake?

Answer: Ebright worked on many projects and conducted experiments. In his eighth grade project, he tried to find the cause of a viral disease that kills nearly all monarch caterpillars every