

## ***THE MAKING OF SCIENTIST***

### **1. How did a book become a turning point in Richard Ebright's life?**

Ans: Richard Ebright indulged in his interest in collecting butterflies. By the time he reached second grade, he had collected all twenty-five species of butterflies found in his hometown. At this moment, his collection of butterflies would have ended. By this time, however, his mother had given him a book titled "The Travels of Monarch X". He learned about the journey of the monarch butterfly to Central America from this book. This book introduced him to science and sparked his interest in monarch butterflies. For Richard Ebright, this turned out to be a turning point in his life. In his basement, he began to raise monarch butterflies and study them at different stages of their lives.

### **2. How did his mother help him?**

Ans: Richard Ebright was helped by his mother, who encouraged his curiosity. She purchased him telescopes, microscopes, cameras, mounting supplies, and other equipment, went on vacation with him, and provided him with various forms of assistance. If he had nothing to do, she found things for him to learn. Even the book that marked a sea change in his life was given to him by his mother. Thus, it may be claimed that his mother had a major influence on his growth as a scientist.

### **3. What lesson does Ebright learn when he does not win anything at a science fair?**

Ans: Ebright is aware that something is not always scientific just because it is on exhibit. It will take actual experiments for him to win a scientific fair.

### **4. What experiments and projects does he then undertake?**

Ans: Most of Ebright's time had been devoted to studying butterflies, especially monarchs. That was the only thing that immediately sprang to mind for the fair the following year. He worked through the several ideas that Dr. Urquhart had given him, one by one. He set out to identify the source of a viral disease that every few years killed almost all monarch caterpillars. He tried raising caterpillars in the company of the disease-carrying beetles to achieve this.

Even though the experiment didn't work out well, he still gained something from it. Later, he experimented to test the theory that viceroy butterflies mimic monarchs to evade avian predators.

### **5. What are the qualities that go into the making of a scientist?**

Ans: Three attributes are necessary for becoming a scientist, according to the author: curiosity, mental acuity, and a strong desire to succeed for the right

reasons. Richard Ebright was an extraordinarily gifted student. Among his many talents were photography, canoeing, public speaking, and debating. He was constantly prepared to go above and above. He was courteous yet competitive. He was intelligent and showed a deep interest right away, which is what inspired him to come up with the idea of cell life.

### **Think About It**

**1. How can one become a scientist, an economist, a historian...? Does it simply involve reading many books on the subject? Does it involve observing, thinking, and doing experiments?**

Ans: It takes more than merely reading books to learn. This is an endeavour to obtain information. The level of learning is based on how your brain interprets the data. Strong curiosity and an unquenchable thirst for knowledge are the first and most crucial requirements for becoming a genius in one's chosen field.

A sharp sense of observation is the next requirement, which enables you to connect your conclusions to what you observe or encounter in the actual world. To validate your findings against a range of factors and in real-world circumstances, experiments are necessary. Finally, but just as importantly, you need to be driven to work hard in your area of interest.

**2. You must have read about cells and DNA in your science books. Discuss Richard Ebright's work in light of what you have studied. If you get an opportunity to work like Richard Ebright on projects and experiments, which field would you like to work in and why?**

Ans: There is a clear biological connection to Ebright's findings. Understanding the anatomy of a cell has helped scientist's better grasp how organisms develop and function. This has helped scientists better understand how microorganisms that cause disease attack and proliferate within human systems. They must have gained insight on how to treat a particular illness from this. Police use DNA fingerprinting to help them find the real offender.

This was not conceivable after DNA was discovered. One amazing example of a little animal that travels thousands of kilometres from North America to the Amazon rainforest is the monarch butterfly. Maybe in the future, we'll be able to create a navigation system just as dependable and strong as monarch butterflies.

### **Important Q. answers:**

**Answer the following questions in 30-40 words:**

**Question 1: Which project did Albright submit in his eighth grade? Why did he win?**

**Answer:** For his eighth grade project, he tried to find the cause of a viral disease that killed all monarch caterpillars every few years. He thought it all happened because of a hectic and tried raising caterpillars in the presence of beetles but he did not get any results. He went ahead and showed his experiments and trials and won a prize.

**Question 2: "Richard was the focus of his mother's attention". Compose a thesis on this.**

**Answer:** Richard was three years old when he lost his father. Then he became the whole world for his mother, his mother was his only companion . At night they just did the things together. His mother encouraged his interest in learning. She took him on trips, bought him telescopes, cameras and other equipments that helped him in other ways. It motivated him brought him to read the book The Travels of Monarch X".

**Question 3: Comment on the role of Mr Weathered in Albright's life,  
Or**

**Who were the important people in Albright's life? Why?**

**Answer:** Ebright's mother who encouraged him as a child and Dr Frederick A. Urquhart 0. had inspired him to study about butterflies were quite important in Albright's life, Also, Ridded A Weathered, Albright's Social Studies teacher opened Albright's mind to new ideas and praised him for his handwork and indomitable spirit.

**Question 4: Why did Ebright lose interest in tagging butterflies?**

**Answer:** Ebright lost interest in tagging butterflies because it was a tedious work that did not provide much feedback.

**Question 5: Identify four values which Richard Ebright projected as a man of substance.**

**Answer:** Ebright was not only a good scientist but also a keen observer. He was a good canoeist, champion debater and a public speaker. He was an expert photographer, particularly of scientific exhibits.

**Question 6: Which project of Ebright won first prize in the county science fair?**

**Answer:** Ebright didn't win anything at his first science fair, thereby realizing that actual experiments alone worked. Later, he started winning prizes. Ebright with his scientist friend first built a device that showed that the tiny gold spots on a monarch pupa were producing a hormone necessary for the butterfly's full development. This project won them first prize in the county science fair and third prize in zoology in the International Science Fair.

**Question 7: What all hobbies did Albright develop in kindergarten?**

**Answer:** As a child, Ebright had a driving curiosity. He was interested in learning new things. He was good at studies and earned top grades in the class. He also collected rocks, fossils and coins. He became an eager astronomer too.

**Question 8: How did Richard's mother help him become a scientist?**

**Or**

**How did Ebright's mother help in his learning?**

**Answer:** Ebright had a driving curiosity and a bright brain which are the essential ingredients for becoming a scientist. His mother encouraged him to learn more. She introduced him to the world around him by taking him to trips, bought him books, telescope, microscope, cameras, mounting materials and other equipments which helped him in his learning.

**Question 9: "Science shows a connection between structure and function." Show this to be true in connection with the spots Albright saw on Monarch pupas.**

**Answer:** Ebright grew cells from a monarch's wing to show that cells could divide and develop into a normal butterfly wing scales only if they were fed with the hormones from the gold spots. Later, he identified the chemical structure of the hormone and found how cells can read the blueprints of its DNA.

**Question 10: How can Albright's theory of cell life be a revolution in the medical field if it is proved correct?**

**Answer:** Ebricht identified the chemical structure of the gold spot hormone and discovered that the cells can read the blueprint of its DNA. To further prove his theory, he began doing experiments'. If his experiments prove correct it will be a big step towards understanding the process of life. It might lead to new ideas for preventing some types of cancer and diseases.

**Question 11: What were the factors which contributed in making Ebricht a scientist?**

**Or**

**What are the essential qualities for becoming a scientist, according to Albright's teacher?**

**Answer:** Sharp brain, observant, analytic mind, driving curiosity, the keen interest in the subject and strong will for the right cause are some of the essentials for the making of a scientist. He should not run after prizes, have a competitive spirit but not in bad sense.

**Question 12: What results are expected if Richard Ebricht's theory is proved correct?**

**Answer:** If Richard Ebricht's theory proves to be correct, it will be a big step towards understanding the processes of life. It might lead to new ideas for preventing some types of cancer and other diseases.

**Question 13: Why did Richard Ebricht tag a flock of butterflies?**

**Or**

**Why did Richard Ebricht start a project of tagging the butterflies?**

**Answer:** Once Ebricht's mother bought him a book .The Travels of Monarch X'. At the end of the book, the writer Dr A. Urquhart had invited the readers to help him in the study of butterfly migration by tagging them. So he started tagging the butterflies.

**Question 14: Describe Richard Ebricht's childhood.**

**Or**

**How did Ebricht spend his time in Pennsylvania?**

**Answer:** Ebricht grew up in north of Reading, Pennsylvania. He was the only child of his parents. His father died when he was in third grade. As a child, he was good at studies and also collected rocks, fossils and coins.

**Question 15: How did the book 'The Travels of Monarch X' become a turning point in Richard Ebright's life?**

**Answer:** Once his mother bought the book. The Travels of Monarch X'. At the end of the book, Dr A. Urquhart had invited readers to help him study the migration of monarch butterflies by tagging them. This book became a turning point in his life.

**Question 16: Mention any two of Ebright's contributions to the world of science.**

**Answer:** He carried experiments to prove successfully that hormone produced by the gold spots of a pupa is responsible for the growth and formation of butterfly-wings. He also discovered how a cell could read the blueprint of its DNA that controls heredity.

### **Long Answer Type Questions for The Making of a Scientist**

**Answer the following questions in 100-150 words:**

**Question 1: 'Success is failure turned inside out'. Prove the above statement with instances from the journey taken by Richard Albright from losing at the science fair to winning at the international fair.**

**Answer:** Success is the fruit of failure. It never comes straight but through failure. This can be seen in the life of Richard Albright. Although he earned top grades in school, on everyday things, he was just like every other kid. He faced many failures in his life but every failure strengthened his will to succeed. When he was in seventh grade he participated in County Science Fair with his slides of frog tissues. But he could not win a prize. This made him determined to win the prize and in his eighth grade he again participated in the science fair with the experiment of viral disease in monarch caterpillars and won the prize. The very next year he participated with his experiment whether viceroy butterflies copy the monarch butterflies in order to save their life from the birds and this project won Albright, third prize in overall country science fair.

Next year his advanced experiments on the monarch pupa won him first place at the international science fair. Thus, for Richard Albright, we can say that success is failure turned inside out. He failed many times but didn't give up. His failures always strengthened his will to perform better.

**Question 2: How does Richard Albright become a scientist?**

**Answer:** Richard Ebright had been a curious child even when he was in kindergarten. His curiosity prompted him to collect rocks, fossils, coins and butterflies. His mother's encouragement and his bright mind also contributed in making him successful. His mother got him all that he needed to develop his scientific bent of mind. His response to Dr Fredrick A. Urquhart to collect butterflies for his research gave him an opportunity in his endeavours. Then in the seventh grade, he got a hint of what real science is when he entered a country science fair and lost. He realized that winners had tried to do real experiments, not simply make a neat display. Thereafter, Ebright worked sincerely on every science project he got every year in school. Then he stood first in a county fair that gave him entry into international science and engineering fair where he won third place. He then went on to win the highest honours and graduated from Harvard. His high school research into the purpose of the spots on a monarch pupa eventually led him to his theory about cell life. Thus he became a renowned scientist.

**Question 3: "Richard Ebright was a successful scientist who gave a new theory of cells to the scientific world." Elucidate.**

**Answer:** Ebright tried experiments on butterflies for a science fair. In his project, in the second year of high school, he tried to explain the purpose of twelve tiny gold spots on a Monarch pupa. He found out that those spots produced a hormone necessary for the full development of a butterfly. He continued with his experiments even after graduation using sophisticated instruments of the university. He discovered the chemical structure of the hormone. He came across his new theory of cell life. It gave an answer to one of the questions - "How a cell can read the blueprint of DNA."

**Question 4: Ebright's backbone was his mother. How did she contribute towards his learning? What kind of work did she find for him even at the dining table? What values did Ebright imbibe from his mother?**

**Or**

**Discuss the role of Ebright's mother in making him a scientist.**

**Answer:** Ebright's mother played an important role in making him a scientist. She motivated him to learn new things. She took him on trips, bought him telescopes, microscopes, cameras, mounting material and other equipment. Every evening mother and son worked together at the dining table. If Ebright had nothing to do, she would find his work - learning work. He was a keen learner, liked learning and got 'A' grade throughout his schooling. She also bought him a book, 'The Travels of Monarch X', which opened the world of science to him. Ebright's mother helped him become a scientist by sustaining his interest in the scientific field.