

CLASS – 10

ENGLISH

Footprints without Feet

CH-6 : The Making of a Scientist

Part – 3

Richard's Science Fair & Research

ARPITA SHARMA



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OVERVIEW

1. Richard Ebright: Curious young collector

2. The Power of a Good Book

3. Richard's Science Fair & Research

4. Ebright: Emerging Scientist





Ebright's project was to see whether, in fact, birds would eat monarchs. He found that a **starling** would not eat ordinary bird food. It would eat all the monarchs it could get.

(Ebright said later research by other people showed that viceroy probably do copy the monarch.)

Starling : मैना

This project was placed first in the

zoology division and third overall in

the county science fair. In his second

year in high school, Richard Ebright

began the research that led to his

discovery of an unknown insect

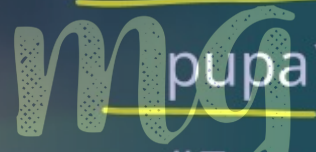
hormone. Indirectly, it also led to his

new theory on the life of cells.

Zoology : जन्तु विज्ञान



The question he tried to answer was
simple: What is the purpose of the
twelve tiny gold spots on a monarch
pupa?

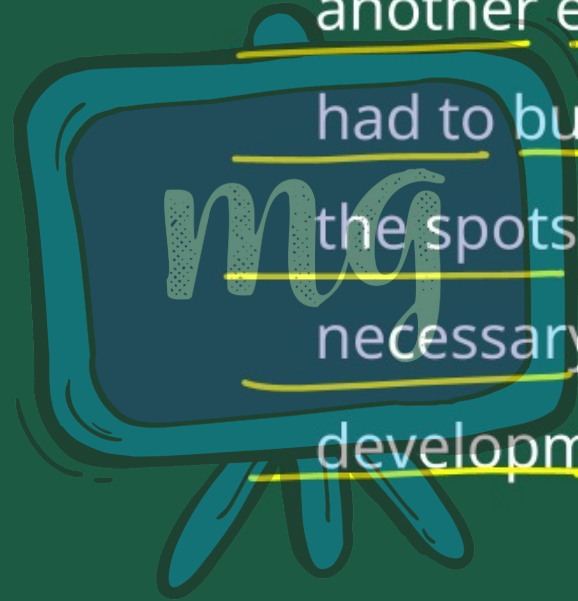


“Everyone assumed the spots were
just ornamental,” Ebright said.

“But Dr Urquhart didn’t believe it.”

Assumed	:	अनुमान लगाना
Ornamental	:	सजावटी

To find the answer, Ebright and another excellent science student first had to build a device that showed that the spots were producing a hormone necessary for the butterfly's full development.



This project won Ebright first place in the county fair and entry into the International Science and Engineering Fair. There he won third place for zoology. He also got a chance to work during the summer at the entomology laboratory of the Walter Reed Army Institute of Research.

Zoology	:	जंतु विज्ञान
Entomology	:	कीट विज्ञान
Laboratory	:	प्रयोगशाला

As a high school junior, Richard

Ebright continued his advanced

experiments on the monarch pupa.

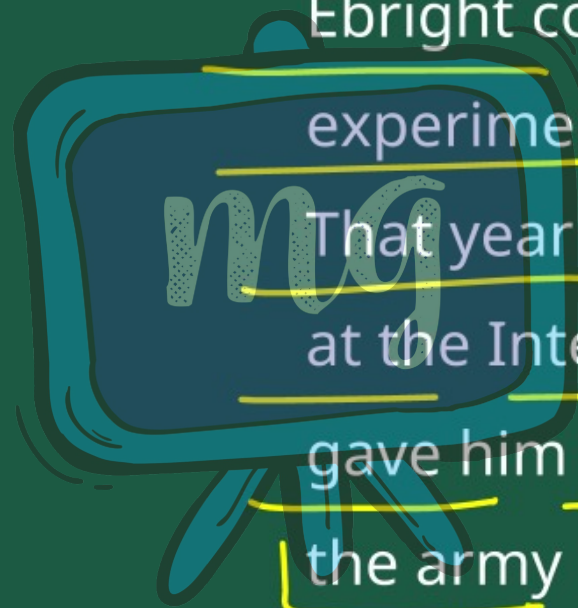
That year his project won first place

at the International Science Fair and

gave him another chance to work in

the army laboratory during the

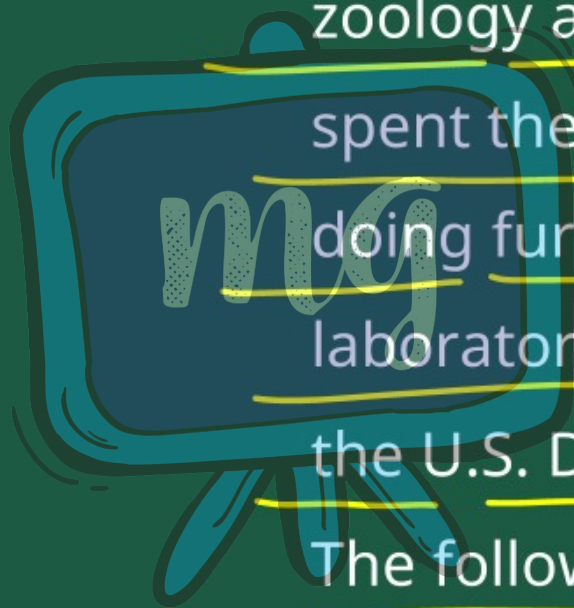
summer.



In his senior year, he went a step further. He grew cells from a monarch's wing in a culture and showed that the cells would divide and develop into normal butterfly wing scales only if they were fed the hormone from the gold spots.

Culture : संवर्धन/कोशिका-जीवाणु समूह

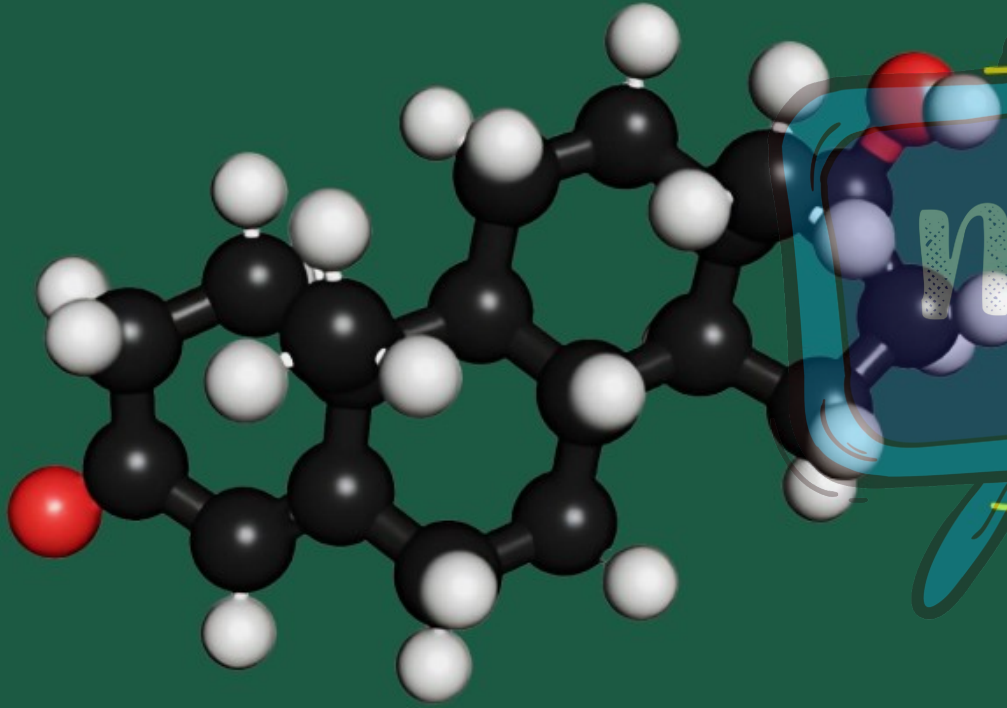
That project won first place for
zoology at the International Fair. He
spent the summer after graduation
doing further work at the army
laboratory and at the laboratory of
the U.S. Department of Agriculture.
The following summer, after his
freshman year at Harvard University,



Ebright went back to the laboratory of the Department of Agriculture and did more work on the hormone from the gold spots.

Using the laboratory's sophisticated instruments, he was able to identify the hormone's chemical structure.

Sophisticated : आधुनिक और जटिल
Chemical structure : रासायनिक संरचना

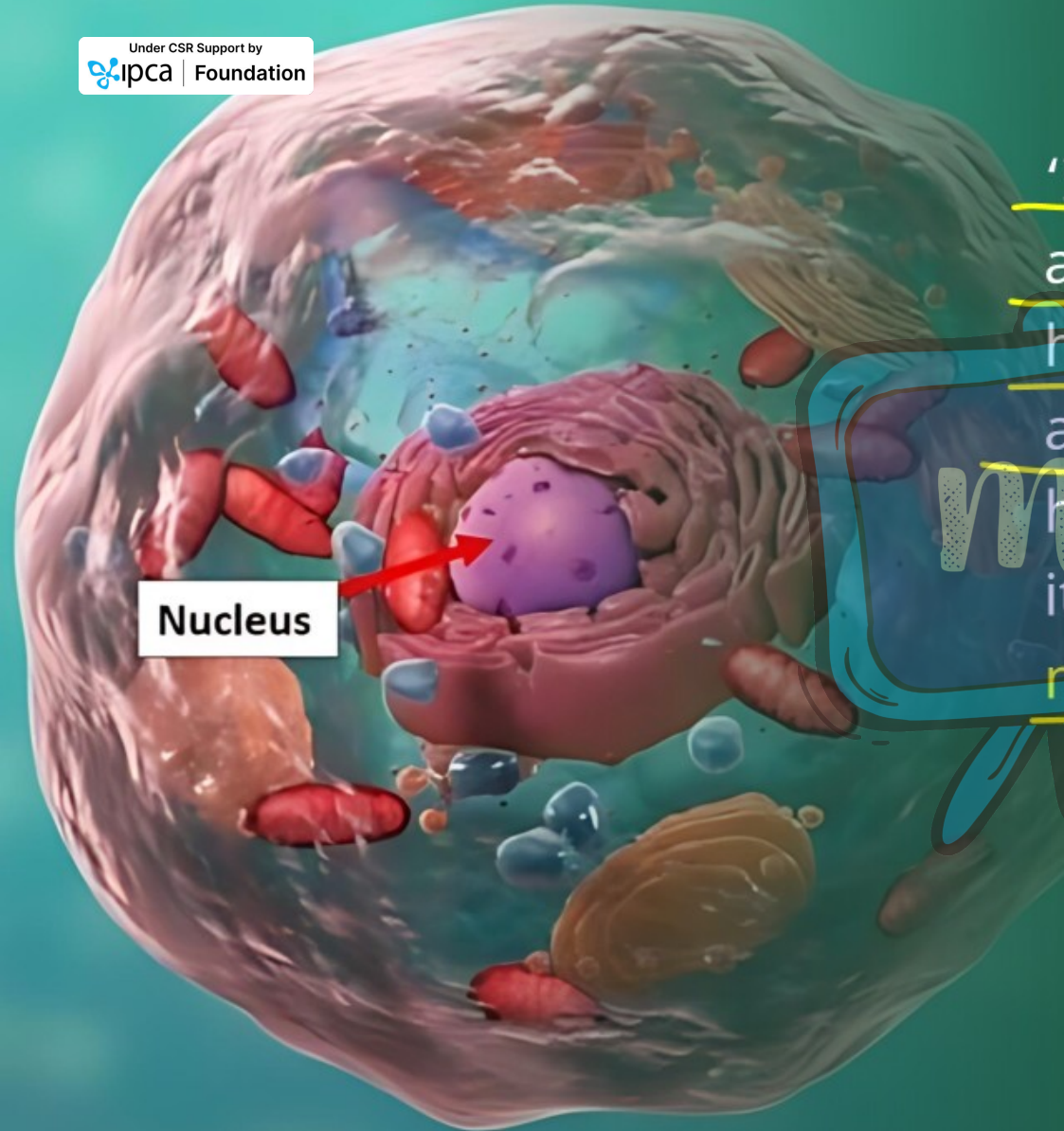


A year-and-a-half later, during his junior year, Ebright got the idea for his new theory about cell life.

It came while he was looking at X-ray photos of the chemical structure of a hormone.)

When he saw those photos, Ebright didn't shout, 'Eureka!' or even,

Eureka : खुशी से चिल्लाना



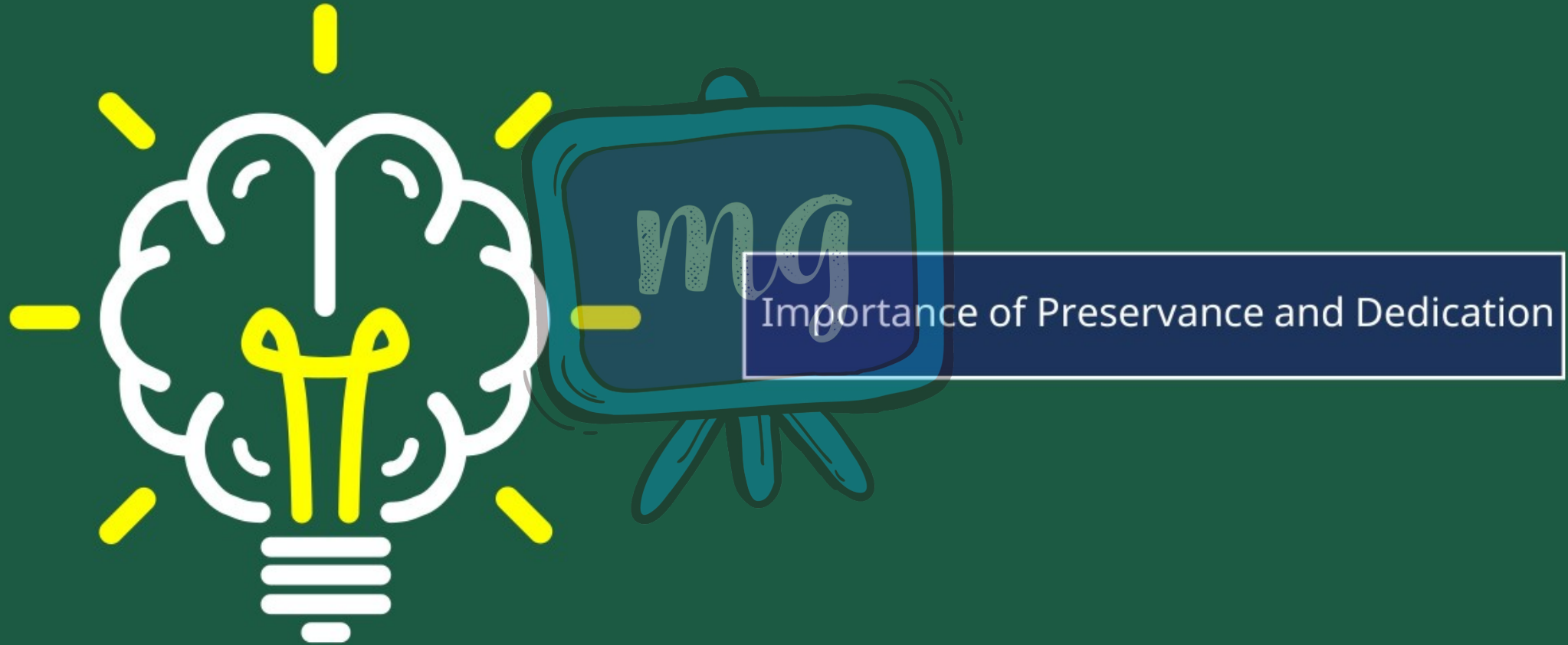
'I've got it!' But he believed that, along with his findings about insect hormones, the photos gave him the answer to one of biology's puzzles: how the cell can 'read' the **blueprint** of its DNA. DNA is the **substance** in the **nucleus** of a cell that controls **heredity**.

- Blueprint : कार्य योजना
- Substance : पदार्थ
- Nucleus : केन्द्रक
- Heredity : आनुवंशिकता

It determines the form and function
of the cell. Thus DNA is the blueprint
for life.



LEARNING OUTCOME





1

What was the primary research question that Ebright investigated in his second year of high school?

- A The migration patterns of monarch butterflies.
- B The purpose of the gold spots on a monarch pupa.
- C The cause of a viral disease affecting monarch caterpillars.
- D The mimicry of viceroy butterflies.



2

What was the main contribution of Ebright's research to the understanding of cell biology?

- A He discovered a new species of butterfly.
- B He proved that viceroy butterflies mimic monarchs.
- C He developed a new theory about how cells "read" the blueprint of their DNA.
- D He demonstrated the importance of science fairs for young scientists.



3

Ebright's research on the monarch pupa led to his discovery of an unknown ____.

- A virus
- B insect hormone
- C mineral
- D plant



4

DNA is the substance in the nucleus of a cell that controls ____.

- A growth
- B heredity
- C movement
- D digestion