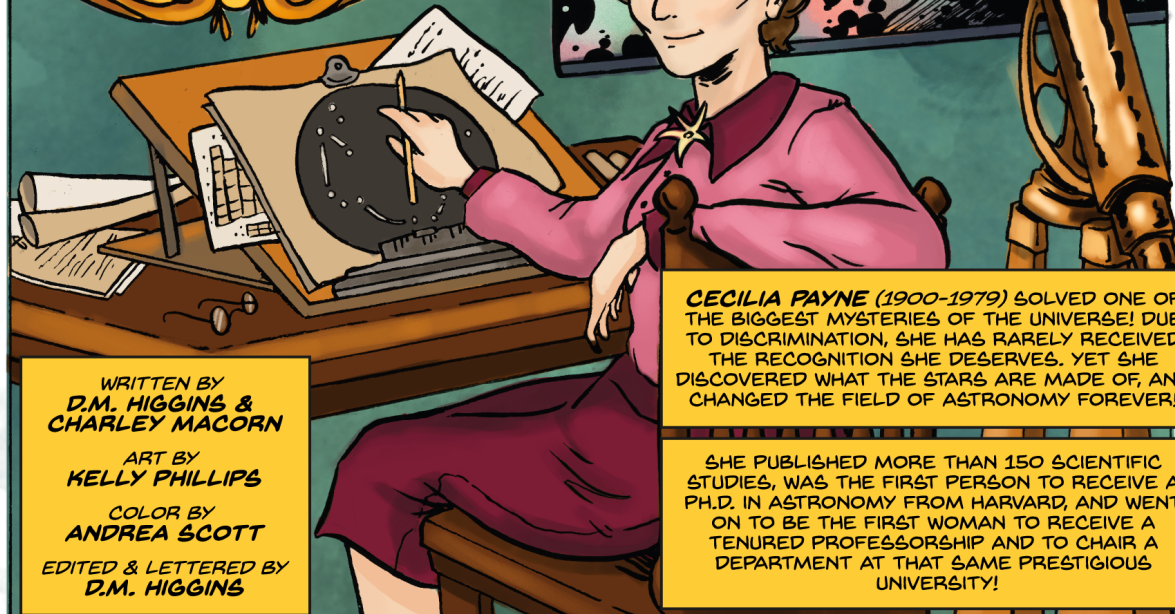


Science Sleuths of HISTORY:

Cecilia Payne!



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CECILIA PAYNE (1900-1979) SOLVED ONE OF THE BIGGEST MYSTERIES OF THE UNIVERSE! DUE TO DISCRIMINATION, SHE HAS RARELY RECEIVED THE RECOGNITION SHE DESERVES. YET SHE DISCOVERED WHAT THE STARS ARE MADE OF, AND CHANGED THE FIELD OF ASTRONOMY FOREVER!

SHE PUBLISHED MORE THAN 150 SCIENTIFIC STUDIES, WAS THE FIRST PERSON TO RECEIVE A PH.D. IN ASTRONOMY FROM HARVARD, AND WENT ON TO BE THE FIRST WOMAN TO RECEIVE A TENURED PROFESSORSHIP AND TO CHAIR A DEPARTMENT AT THAT SAME PRESTIGIOUS UNIVERSITY!

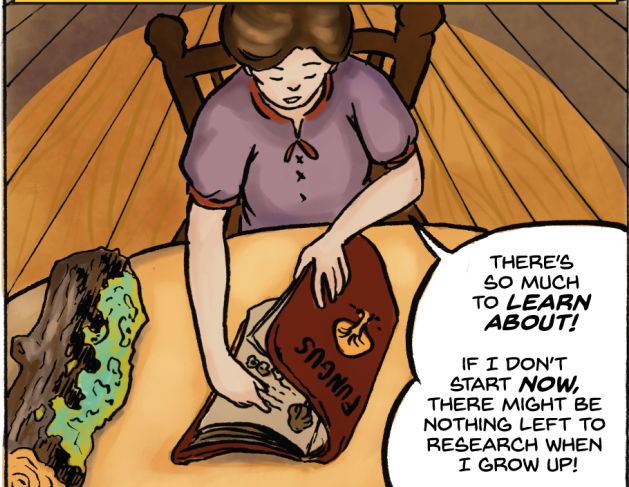
ENGLAND, 1905.

THE BEAUTY OF THE NATURAL WORLD ALWAYS FASCINATED YOUNG CECILIA PAYNE!



A METEOR!!
WHAT IS IT?
HOW DOES IT WORK?

HER DESIRE TO **UNDERSTAND** THE NATURAL WORLD MADE HER A PRECOCIOUS RESEARCHER.



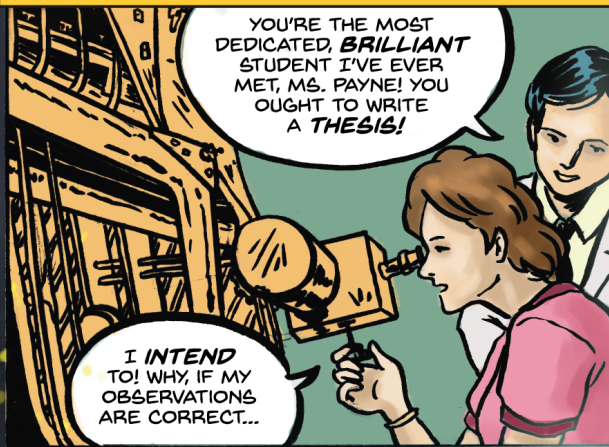
THERE'S SO MUCH TO LEARN ABOUT!
IF I DON'T START **NOW**, THERE MIGHT BE NOTHING LEFT TO RESEARCH WHEN I GROW UP!

AT THE AGE OF 18, CECILIA WON A SCHOLARSHIP TO CAMBRIDGE UNIVERSITY, WHERE SHE STUDIED **BOTANY, PHYSICS, AND CHEMISTRY.**



YET CAMBRIDGE DID NOT EVEN AWARD **DEGREES TO WOMEN** AT THE TIME!

SO, TO SEEK BETTER CAREER OPPORTUNITIES, SHE TRANSFERRED TO RADCLIFFE IN THE U.S. AND WORKED AT THE HARVARD OBSERVATORY.



YOU'RE THE MOST DEDICATED, **BRILLIANT** STUDENT I'VE EVER MET, MS. PAYNE! YOU OUGHT TO WRITE A **THESIS!**

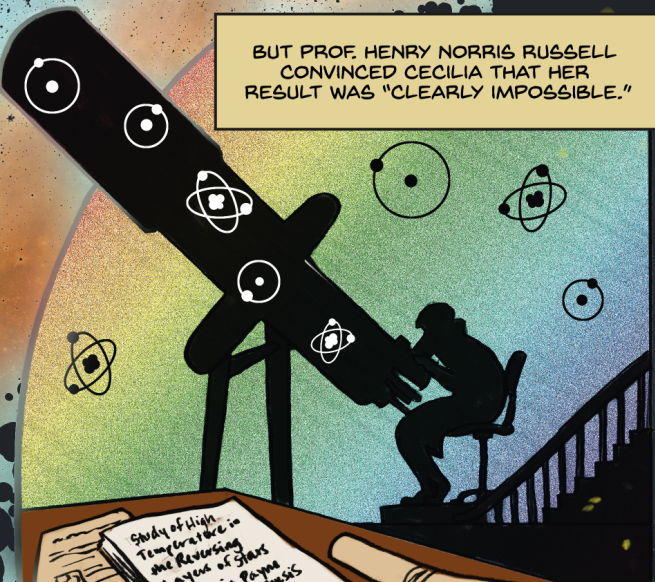
I **INTEND** TO! WHY, IF MY OBSERVATIONS ARE CORRECT...

AT THE TIME, SCIENTISTS THOUGHT THE STARS AND PLANETS WERE ALL MADE UP OF THE SAME **ELEMENTS** IN THE SAME BASIC **PROPORTIONS.**

BUT, BY MEASURING NOT ONLY THE **BRIGHTNESS** OF STARS, BUT ALSO THE WAY OTHER LIGHT **REACTED** TO THE STAR, CECILIA WAS ABLE TO DETERMINE THE **ACTUAL** CHEMICAL COMPOSITION OF THE STARS!

SHE FOUND THAT THE STARS WERE PRIMARILY **GASES**--HELIUM AND HYDROGEN--AND THAT THEY CONTAIN A **MILLION** TIMES MORE HYDROGEN THAN EARTH!

THIS LED TO HER FANTASTIC DISCOVERY THAT HYDROGEN WAS THE MOST **ABUNDANT** ELEMENT IN THE **UNIVERSE.**



BUT PROF. HENRY NORRIS RUSSELL CONVINCED CECILIA THAT HER RESULT WAS "CLEARLY IMPOSSIBLE."

IT WAS **REVOLUTIONARY!**

ON HIS ADVICE, SHE BACKED DOWN AND ADDED A LINE TO HER THESIS THAT HER OWN OBSERVATIONS WERE "ALMOST CERTAINLY NOT REAL."

YET FOUR YEARS LATER, RUSSELL PUBLISHED HIS OWN BOOK, REACHING THE SAME CONCLUSIONS AS PAYNE, USING DIFFERENT METHODS.

SHE LATER WROTE HER MOST IMPORTANT "WARNING" TO YOUNG SCIENTISTS:



IF YOU ARE SURE OF YOUR FACTS, YOU SHOULD DEFEND YOUR POSITION.

THOUGH SHE FACED SETBACKS AND DISCRIMINATION BECAUSE OF HER GENDER, **CECILIA PAYNE, SCIENCE SLEUTH**, CHANGED OUR UNDERSTANDING OF THE UNIVERSE--FOREVER!

THOUGH SHE MAY HAVE BEEN DENIED CREDIT SHE WAS DUE IN HER LIFE, THE IMPORTANCE OF HER ACHIEVEMENTS IS UNDENIABLE.

