

MARIE MOINARD & CHRISTELLE PECOUT

WOMEN DISCOVERERS

TOP WOMEN IN SCIENCE



nbm
GRAPHIC NOVELS



ADA
LOVELACE

MAE
JEMISON

MARIE
CURIE

HEDY
LAMARR

ROSALIND
FRANKLIN

**“In Life, nothing is to be feared, all to be understood.”
Marie Curie**

20 women who made a difference in Science are presented here. From Ada Lovelace (computing) to Marie Curie (Physics and Chemistry) these exceptional women enabled the world to advance in all fields of science including space exploration (Mae Jemison), telecommunications (the actress also genius discoverer Hedy Lamarr) and Biology (Rosalind Franklin). An inspiration going counter to preconceived notions about women and science, presenting a diverse group from around the world.

WOMEN DISCOVERERS

TOP WOMEN IN SCIENCE



nbm GRAPHIC
NOVELS
Nantier • Beall • Minoustchine
N E W Y O R K

Thanks to Christelle for having put these pages into pictures so beautifully. This is for girls to feel able to dare all their dreams.
To Noémie.

Marie Moinard

Thanks to Marie to have left me the freedom I needed, essential to reach our goals. And to Jean-Paul Moulin for his patience.
To all women who didn't always get the recognition they deserved for their work.

Christelle Pecout

Thanks to Lucie and Iris Moulin for having been the inspiration behind this project and for their sustained support.

Jean-Paul Moulin

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INTRODUCTION

"The bells never sound the end of discovery." -Colette

While countless women throughout history have made enormous contributions to the fields of science and technology, many of them, unfortunately, are not synonymous with the words "discovery" and "invention" in the minds of the general public.

From Ada Lovelace to Xie Yi, from Marie Curie to Emilie du Châtelet, this book is so fascinating you will want to read it a single sitting! It will take you on a journey around the world on which you will be introduced to some of the Great Ladies of Science and Technology from the last few centuries!

With this book, equally remarkable in its writing and its illustrations, authors Marie Moinard and Christelle Pecout pay a beautiful tribute to these emblematic women who left their mark on the world with wide-reaching scientific discoveries and were often pioneers of cutting-edge technologies currently used by our businesses and economies 4.0.

As you will discover, their work and research was sometimes attributed to their male colleagues or remained in the shadows for years...

Fortunately, mindsets have changed over the years and the time has come to shine the spotlight on these exceptional women and their extraordinary accomplishments, who were always driven by a passion for science and a deep desire to help advance research and technology.

Our twenty-first century society needs to promote awareness of these female role models, so that their accomplishments can inspire more and more young women to follow the calling of science and go on to make discoveries of their own.

To that end, reading this Women Discoverers, Top Women in Science is a great place to start.

Happy reading!

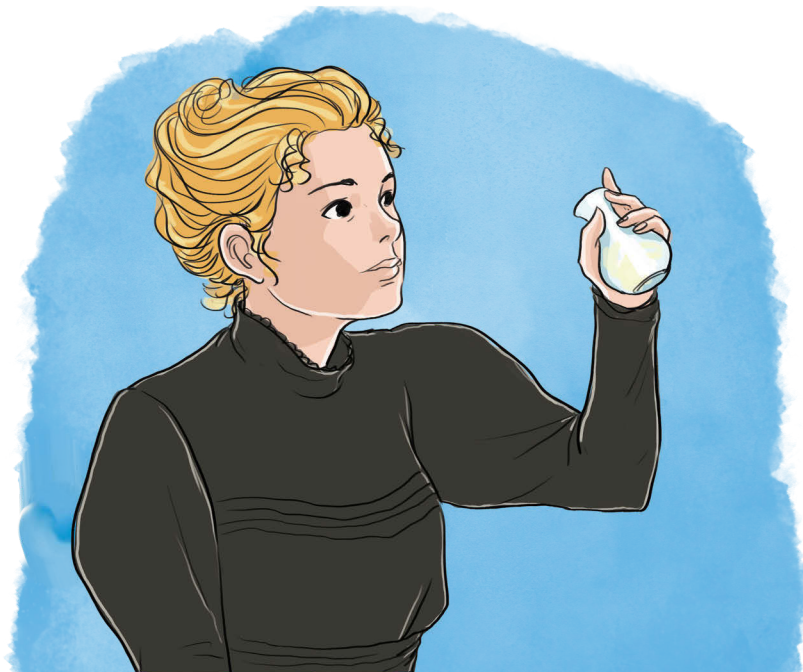
Marie- Sophie Pawlak

President of "Elles Bougent," a French society for the promotion of women in Science

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MARIE CURIE



1867 - 1934

Polish-French physicist and chemist who, along with her husband Pierre Curie, discovered radium. Nobel Prize in Physics 1903 shared with Pierre Curie and Henri Becquerel. Nobel Prize in Chemistry 1911.

PARIS -
1891.

MARIA,
MY DEAR
SISTER!

BRONIA!

WE DID IT! I NEVER
COULD HAVE COME TO
PARIS TO STUDY WITHOUT
THE MONEY YOU SENT. YOU
WORKED SO HARD TO KEEP
YOUR PROMISE!

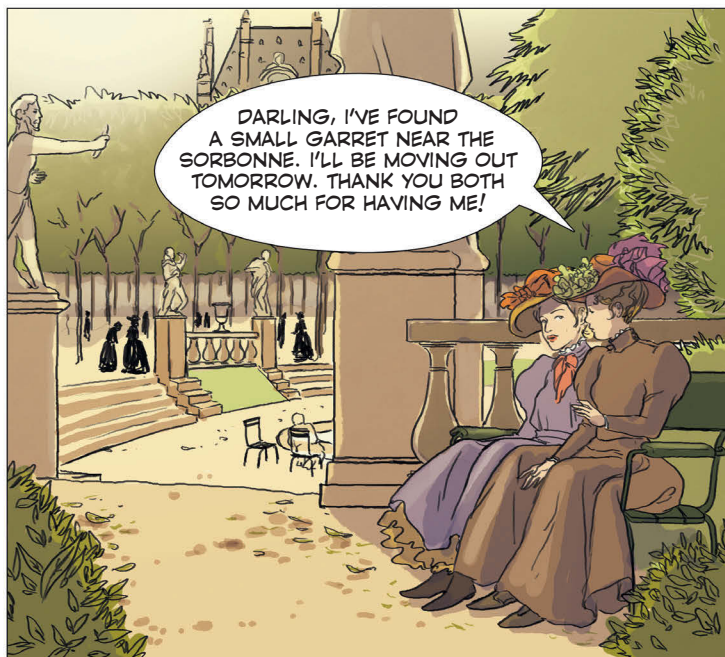
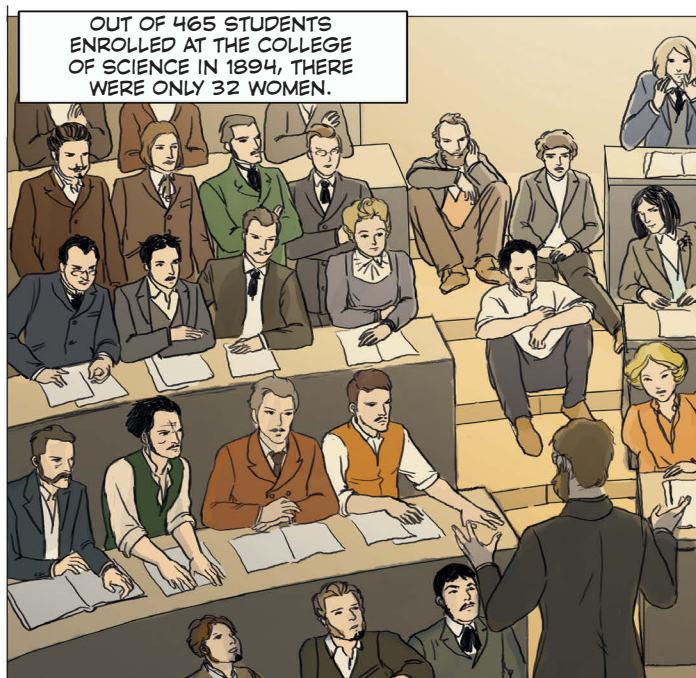
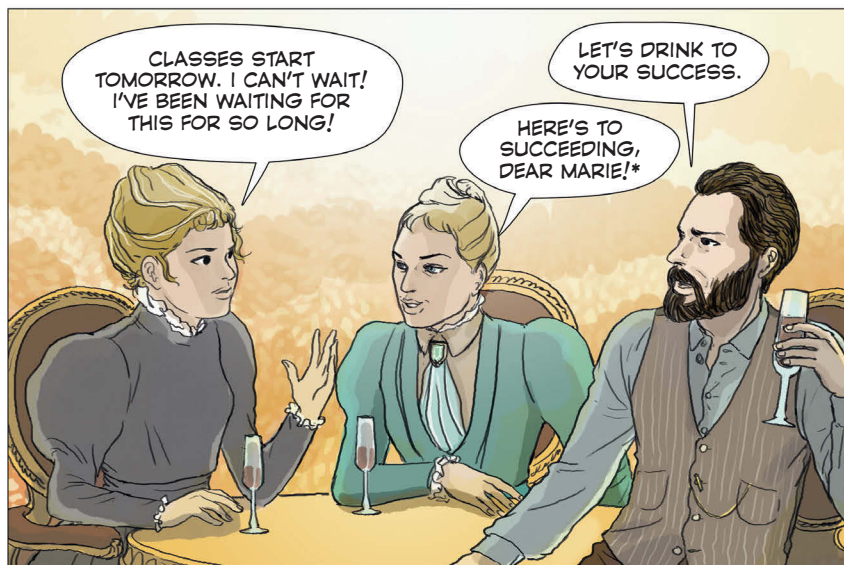
BRONIA SKŁODOWSKA, A MEDICAL STUDENT,
LIVED WITH HER HUSBAND, DOCTOR CASIMIR
DŁUSKI, IN A SMALL APARTMENT NEAR
THE BUTTES CHAUMONT PARK.

WE KEPT OUR
WORD TO EACH
OTHER. NOW THAT
I'M HERE, I CAN'T
WAIT TO START!

WELL DONE, MARIA! YOU
BROKE ALL THE RULES BY
ATTENDING THE SECRET
CLASSES FOR WOMEN AT
THE FLYING UNIVERSITY
OF KRAKOW.

I HAD NO CHOICE,
GIVEN THAT THE RUSSIAN
EMPIRE BANS YOUNG
POLISH WOMEN FROM
HIGHER EDUCATION.

WELL, YOU'RE IN
PARIS NOW, AND THE
SORBONNE AWAITS.
LET'S GO GET YOU
ENROLLED!



IN 1893, SHE GRADUATED FIRST
IN HER CLASS WITH A DEGREE IN
PHYSICAL SCIENCE UNDER THE
GUIDANCE OF PROFESSOR
LIPPMANN AT THE SORBONNE.



MADemoiselle SKLODOWSKA,
I HEAR YOU'RE ALSO GETTING A
DEGREE IN MATHEMATICS?

YES, WHY DO
THINGS HALF
WAY?



"...WE'D LIKE TO HIRE YOU FOR
AN EXPERIMENTAL STUDY ON
THE MAGNETIC PROPERTIES OF
VARIOUS STEELS. SIGNED:
THE SOCIETY FOR THE
PROMOTION OF
INDUSTRY."



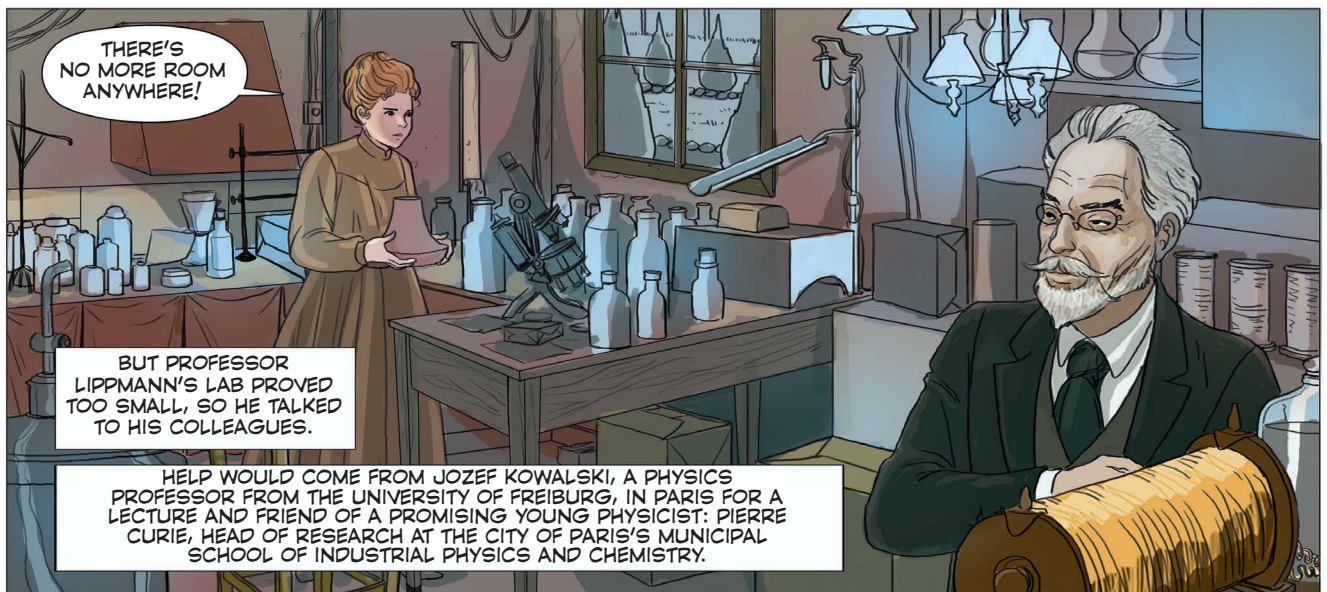
WHEW! PERFECT
TIMING! I AM
COMPLETELY
BROKE.

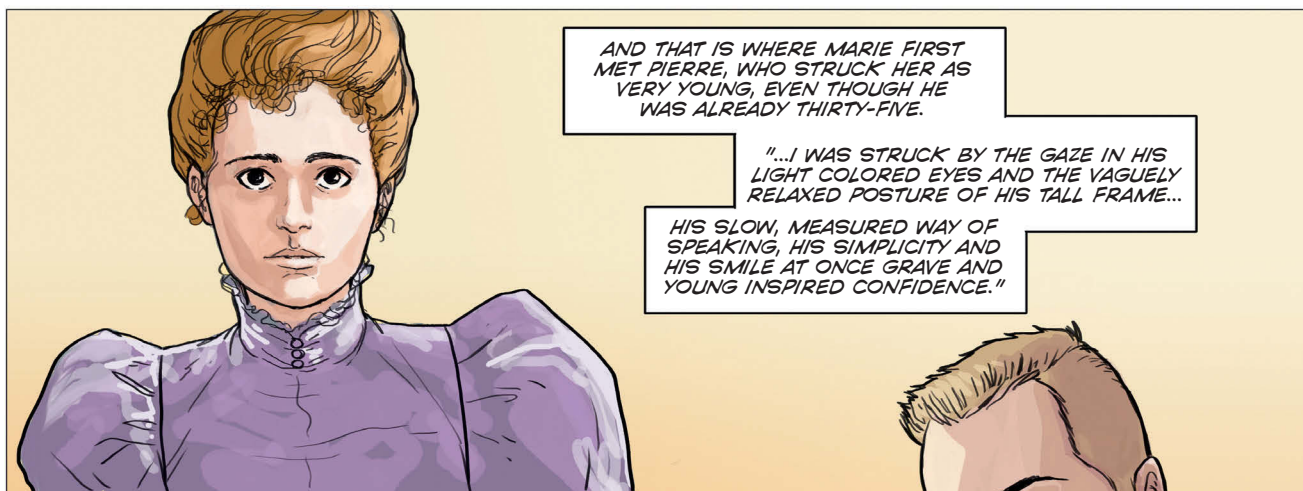


THERE'S
NO MORE ROOM
ANYWHERE!

BUT PROFESSOR
LIPPMANN'S LAB PROVED
TOO SMALL, SO HE TALKED
TO HIS COLLEAGUES.

HELP WOULD COME FROM JOZEF KOWALSKI, A PHYSICS
PROFESSOR FROM THE UNIVERSITY OF FREIBURG, IN PARIS FOR A
LECTURE AND FRIEND OF A PROMISING YOUNG PHYSICIST: PIERRE
CURIE, HEAD OF RESEARCH AT THE CITY OF PARIS'S MUNICIPAL
SCHOOL OF INDUSTRIAL PHYSICS AND CHEMISTRY.

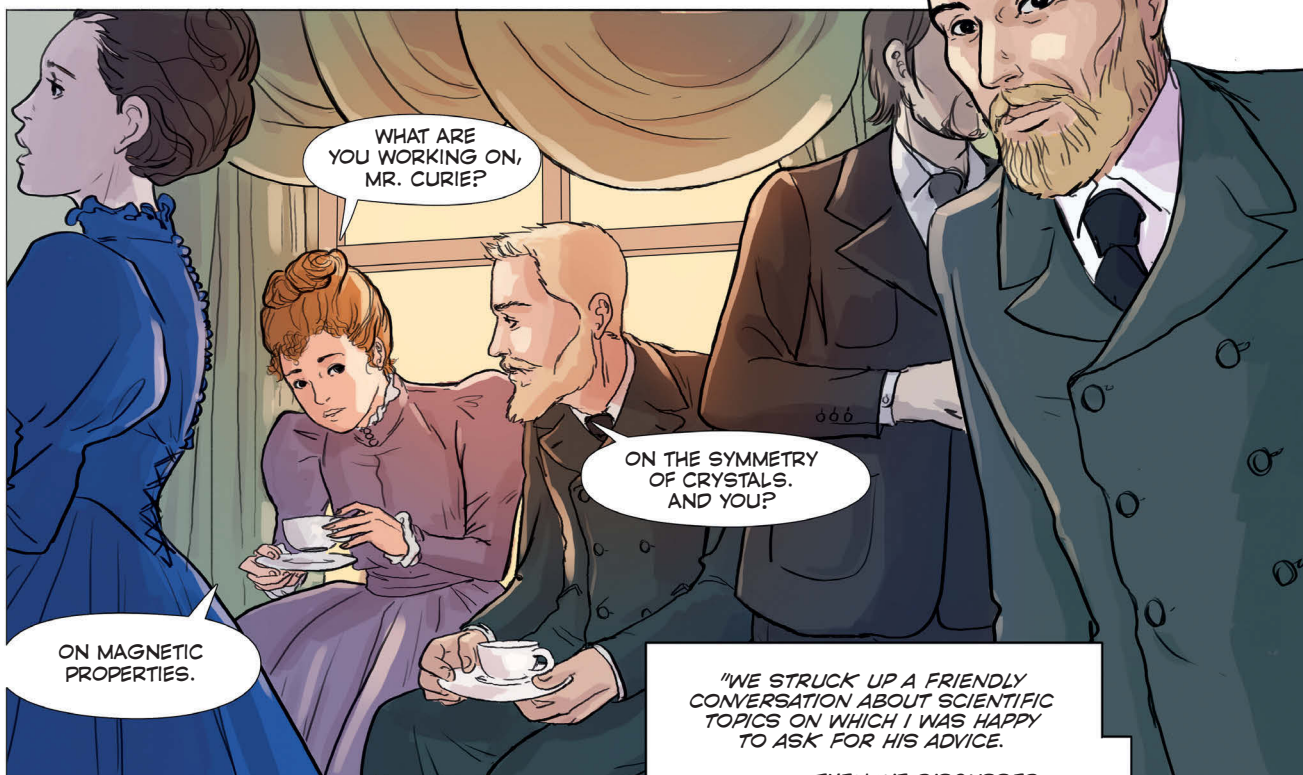




AND THAT IS WHERE MARIE FIRST MET PIERRE, WHO STRUCK HER AS VERY YOUNG, EVEN THOUGH HE WAS ALREADY THIRTY-FIVE.

"...I WAS STRUCK BY THE GAZE IN HIS LIGHT COLORED EYES AND THE VAGUELY RELAXED POSTURE OF HIS TALL FRAME...

HIS SLOW, MEASURED WAY OF SPEAKING, HIS SIMPLICITY AND HIS SMILE AT ONCE GRAVE AND YOUNG INSPIRED CONFIDENCE."



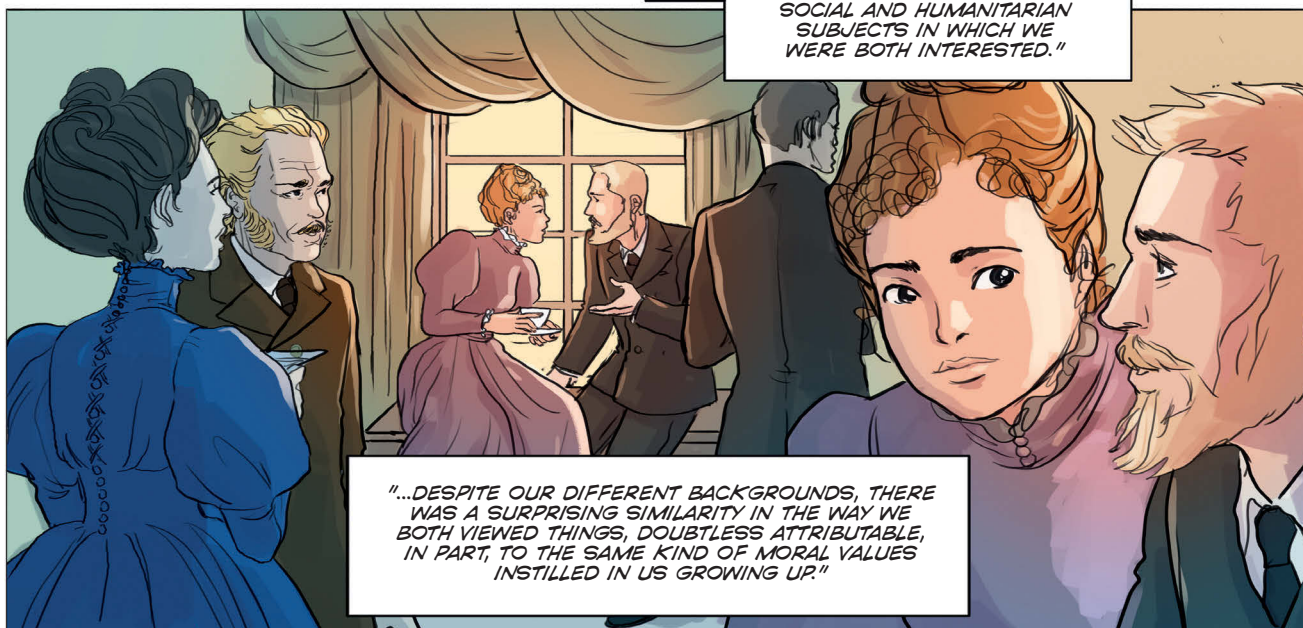
WHAT ARE YOU WORKING ON, MR. CURIE?

ON THE SYMMETRY OF CRYSTALS. AND YOU?

ON MAGNETIC PROPERTIES.

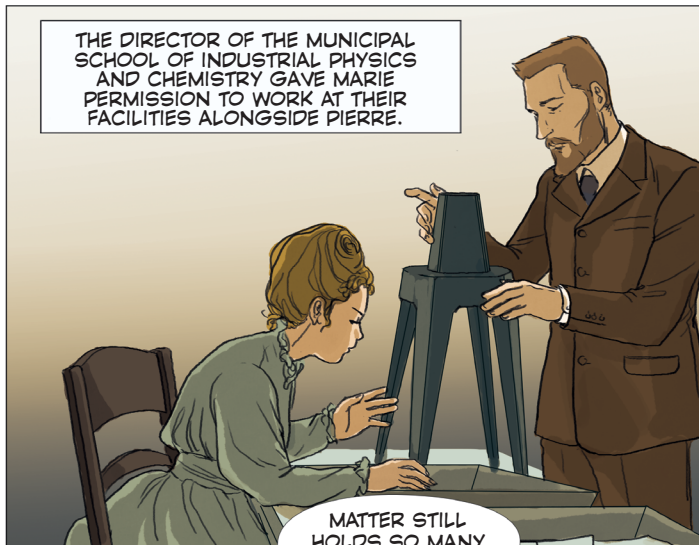
"WE STRUCK UP A FRIENDLY CONVERSATION ABOUT SCIENTIFIC TOPICS ON WHICH I WAS HAPPY TO ASK FOR HIS ADVICE.

THEN WE DISCUSSED SOCIAL AND HUMANITARIAN SUBJECTS IN WHICH WE WERE BOTH INTERESTED."



"...DESPITE OUR DIFFERENT BACKGROUNDS, THERE WAS A SURPRISING SIMILARITY IN THE WAY WE BOTH VIEWED THINGS, DOUBTLESS ATTRIBUTABLE, IN PART, TO THE SAME KIND OF MORAL VALUES INSTILLED IN US GROWING UP."

THE DIRECTOR OF THE MUNICIPAL SCHOOL OF INDUSTRIAL PHYSICS AND CHEMISTRY GAVE MARIE PERMISSION TO WORK AT THEIR FACILITIES ALONGSIDE PIERRE.



MATTER STILL HOLDS SO MANY SECRETS!

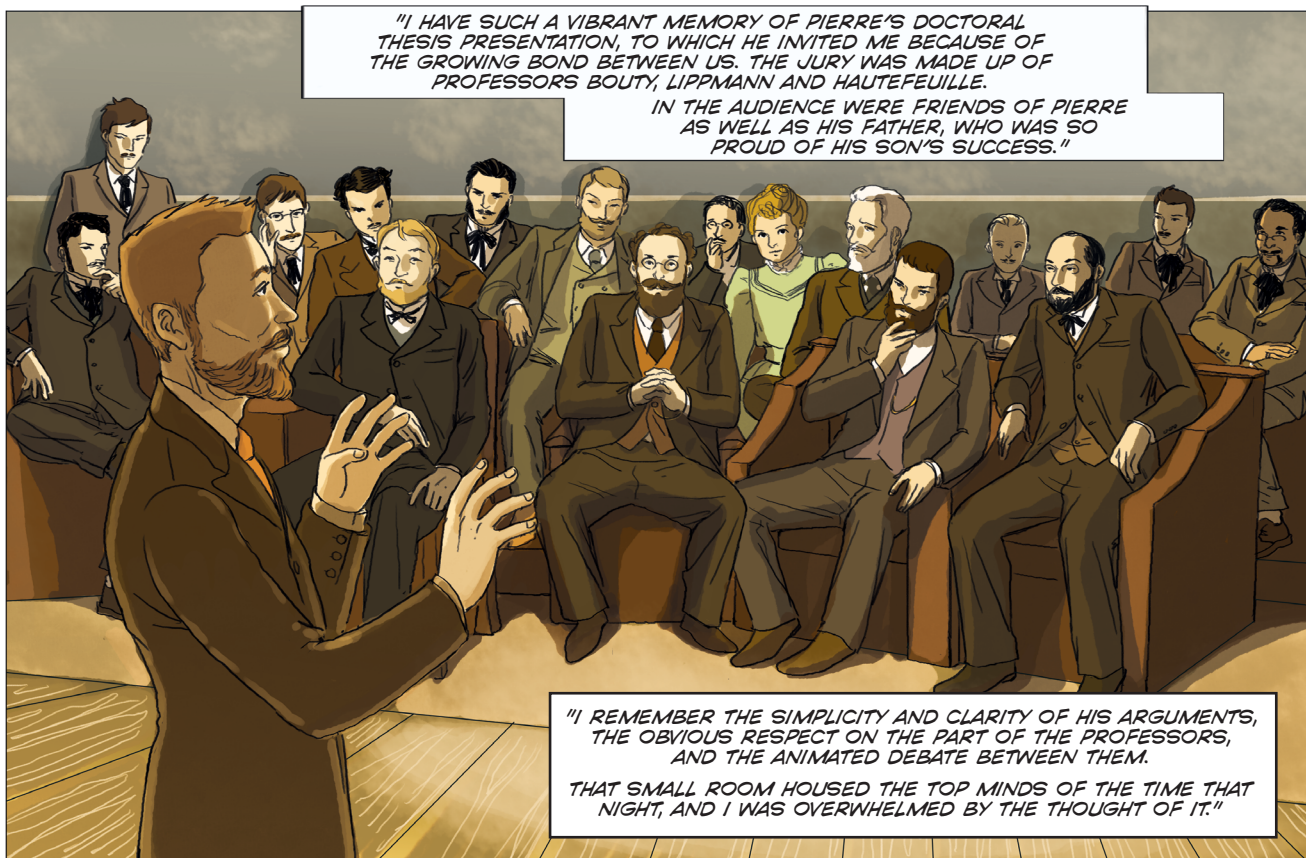


SUCH ELEGANCE IN YOUR EQUATIONS!



"I HAVE SUCH A VIBRANT MEMORY OF PIERRE'S DOCTORAL THESIS PRESENTATION, TO WHICH HE INVITED ME BECAUSE OF THE GROWING BOND BETWEEN US. THE JURY WAS MADE UP OF PROFESSORS BOUTY, LIPPMANN AND HAUTEFEUILLE.

IN THE AUDIENCE WERE FRIENDS OF PIERRE AS WELL AS HIS FATHER, WHO WAS SO PROUD OF HIS SON'S SUCCESS."



"I REMEMBER THE SIMPLICITY AND CLARITY OF HIS ARGUMENTS, THE OBVIOUS RESPECT ON THE PART OF THE PROFESSORS, AND THE ANIMATED DEBATE BETWEEN THEM.

THAT SMALL ROOM HOUSED THE TOP MINDS OF THE TIME THAT NIGHT, AND I WAS OVERWHELMED BY THE THOUGHT OF IT."

SUMMER
1894.

"OUR CORRESPONDENCE DURING
THE TIME WE WERE APART ONLY
DEEPEDED THE BOND THAT HAD
TAKEN HOLD BETWEEN US."

UNTIL
SOON,
PIERRE...

VARSAWA

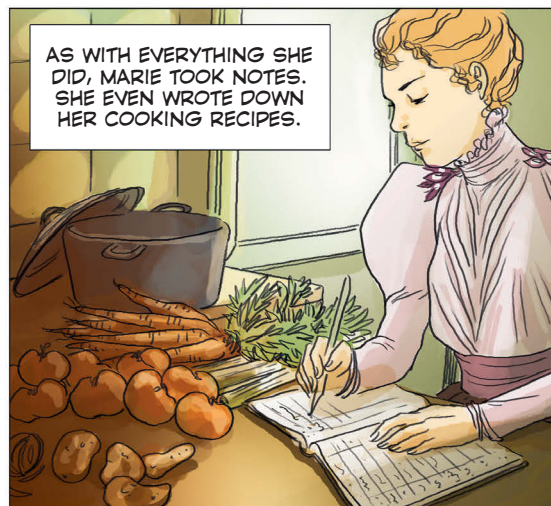
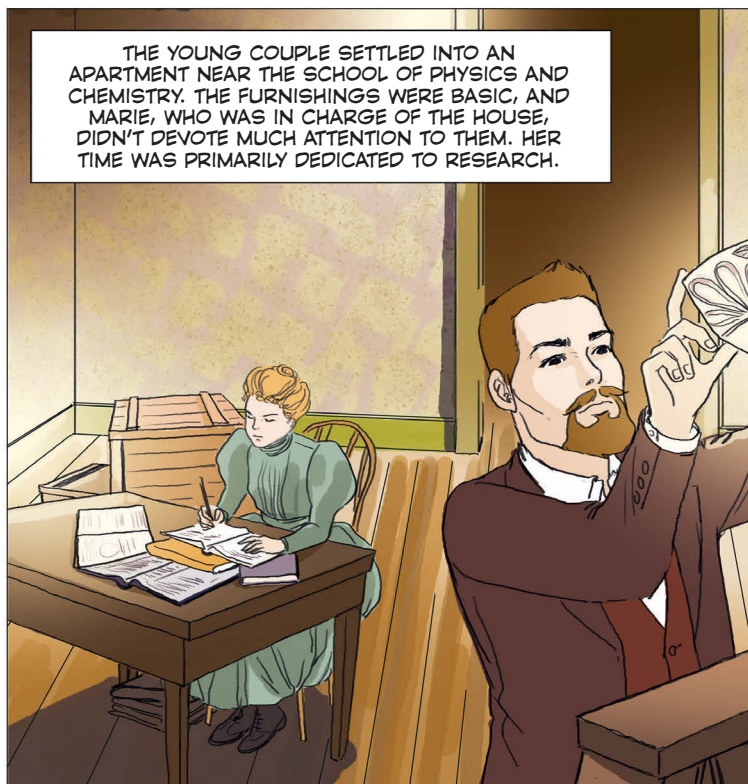
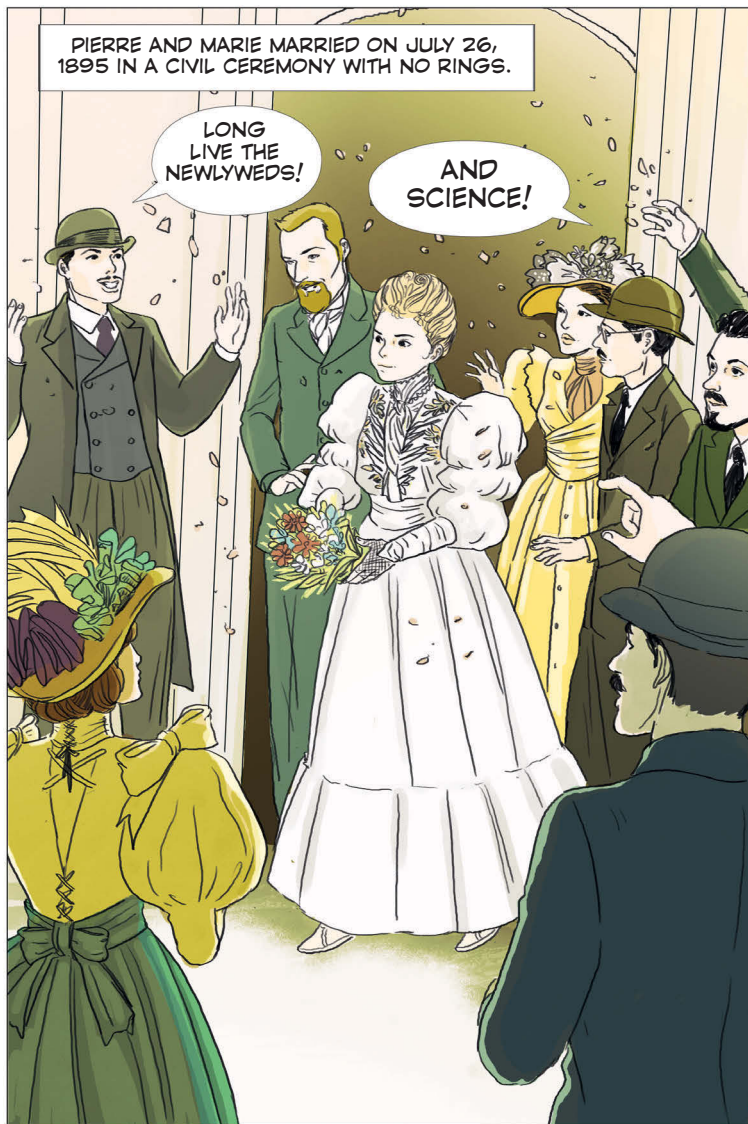
"DEAR MARIE, I DAREN'T
HOPE FOR SUCH A BEAUTIFUL THING
AS SPENDING OUR LIVES NEAR ONE
ANOTHER, HYPNOTIZED BY OUR DREAMS,
BY YOUR PATRIOTIC DREAM FOR POLAND,
OUR HUMANITARIAN DREAM,
OUR SCIENTIFIC DREAM."

OCTOBER 1894: MARIE
RETURNS TO PARIS. THE
BOND WITH PIERRE DEEPENS.

SHE GRADUATES THIRD IN HER CLASS
CUM LAUDE WITH A DEGREE IN MATHEMATICS.

I DID IT,
BRONIA!

I'M SO HAPPY!
I ALWAYS BELIEVED
IN YOU. QUICK, LET'S
WRITE AND TELL PAPA!



1896. MARIE SCORES FIRST PLACE IN THE CONTEST FOR CERTIFICATION FOR TEACHING MATH TO WOMEN.

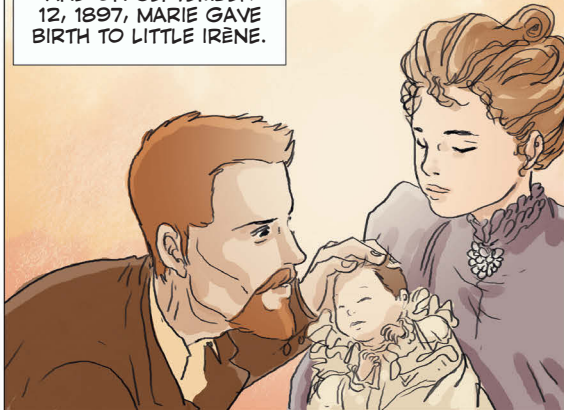
WONDERFUL.
NOW I CAN OFFICIALLY
TEACH, BUT WHAT I
REALLY WANT TO DO
IS RESEARCH!



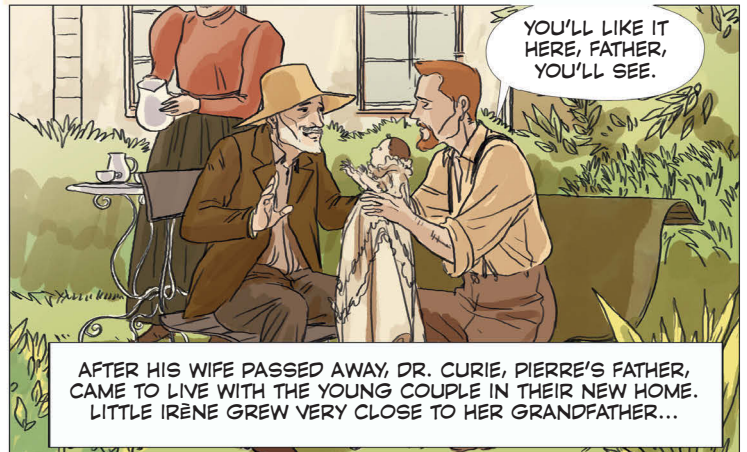
IN 1897, MARIE FINISHED HER WORK ON METALS AND PUBLISHED A 40-PAGE ARTICLE ENTITLED "MAGNETIC PROPERTIES OF VARIOUS STEELS" IN THE JANUARY BULLETIN OF THE SOCIETY FOR THE PROMOTION OF NATIONAL INDUSTRY.

BULLETIN
DE LA
SOCIÉTÉ D'ENCOURAGEMENT
POUR
L'INDUSTRIE NATIONALE

AND ON SEPTEMBER
12, 1897, MARIE GAVE
BIRTH TO LITTLE IRÈNE.

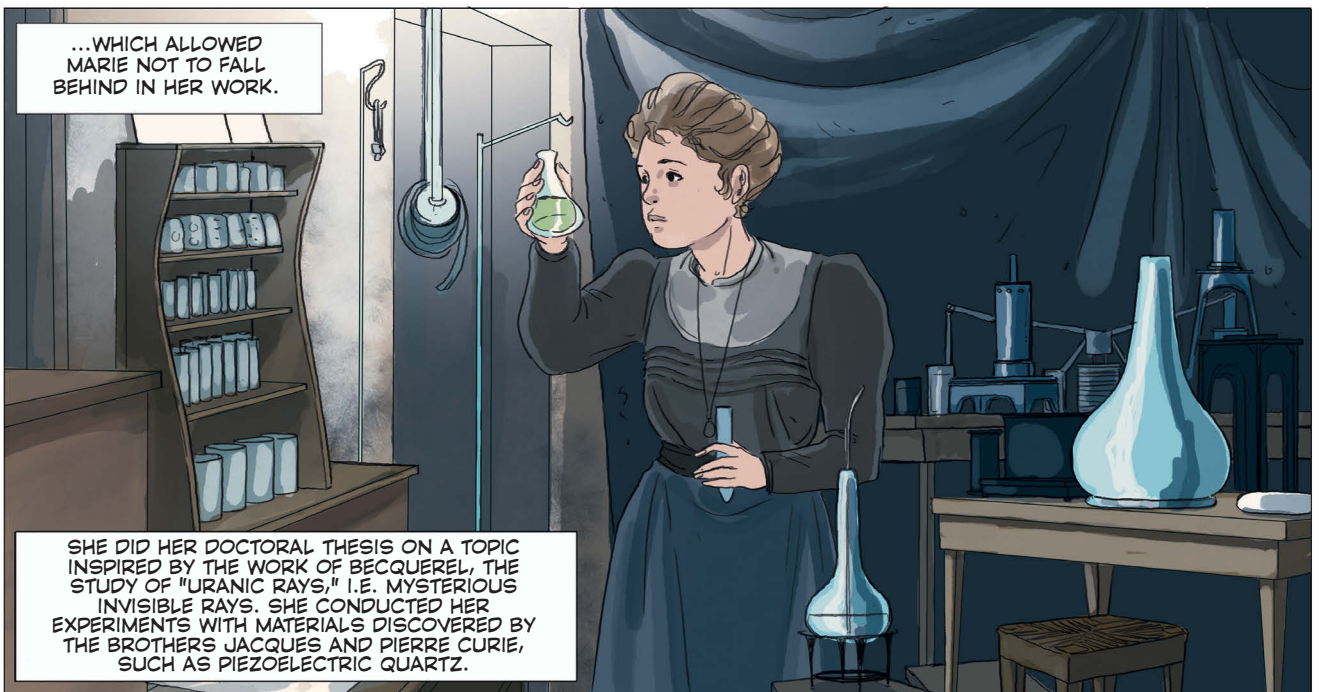


YOU'LL LIKE IT
HERE, FATHER,
YOU'LL SEE.



AFTER HIS WIFE PASSED AWAY, DR. CURIE, PIERRE'S FATHER, CAME TO LIVE WITH THE YOUNG COUPLE IN THEIR NEW HOME. LITTLE IRÈNE GREW VERY CLOSE TO HER GRANDFATHER...

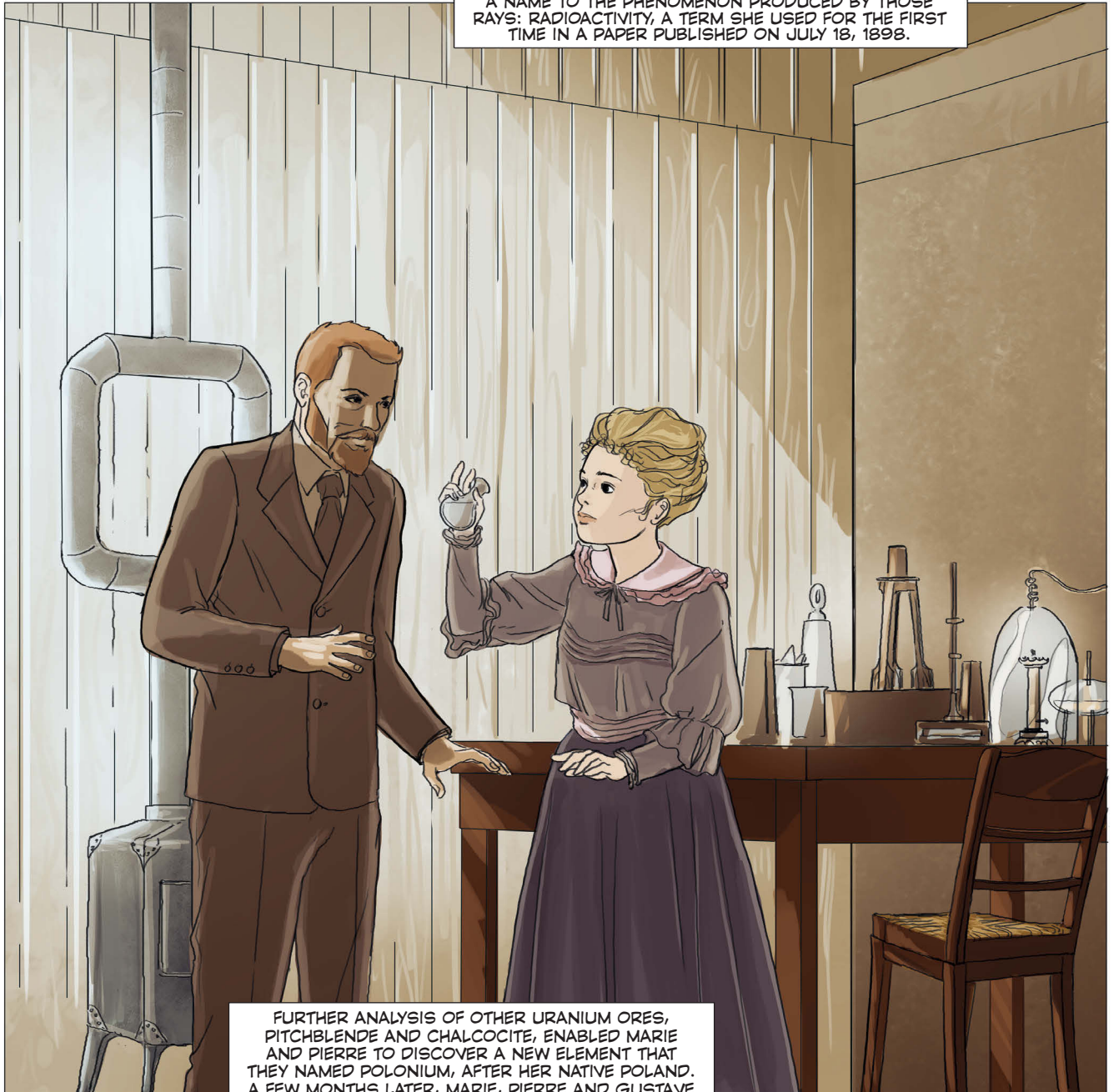
...WHICH ALLOWED
MARIE NOT TO FALL
BEHIND IN HER WORK.



SHE DID HER DOCTORAL THESIS ON A TOPIC INSPIRED BY THE WORK OF BECQUEREL, THE STUDY OF "URANIC RAYS," I.E. MYSTERIOUS INVISIBLE RAYS. SHE CONDUCTED HER EXPERIMENTS WITH MATERIALS DISCOVERED BY THE BROTHERS JACQUES AND PIERRE CURIE, SUCH AS PIEZOELECTRIC QUARTZ.

MARIE'S WORK PRODUCED IMPRESSIVE RESULTS. PIERRE ABANDONED HIS OWN RESEARCH AND BEGAN WORKING ON HIS WIFE'S PROJECTS.

THEY CONFIRMED THAT URANIUM COMPOUNDS EMIT RADIATION AND ALSO BRING OUT THOSE PROPERTIES IN THORIUM WITH A DIFFERENT INTENSITY. MARIE GAVE A NAME TO THE PHENOMENON PRODUCED BY THOSE RAYS: RADIOACTIVITY, A TERM SHE USED FOR THE FIRST TIME IN A PAPER PUBLISHED ON JULY 18, 1898.



FURTHER ANALYSIS OF OTHER URANIUM ORES, PITCHBLEND AND CHALCOCITE, ENABLED MARIE AND PIERRE TO DISCOVER A NEW ELEMENT THAT THEY NAMED POLONIUM, AFTER HER NATIVE POLAND. A FEW MONTHS LATER, MARIE, PIERRE AND GUSTAVE BÉMON ISOLATED A SECOND RADIOACTIVE CHEMICAL ELEMENT, WHICH THEY NAMED RADIUM.

UNFORTUNATELY, THEY WOULD HAVE TO DO CONSIDERABLE MORE WORK PURIFYING THESE NEW ELEMENTS BEFORE DISCOVERING THEIR TRUE NATURE. AND SO THE Curies EMBARKED ON THAT GARGANTUAN TASK, STARTING WITH ONE METRIC TON OF PITCHBLEND ORE.

THAT ENORMOUS AMOUNT OF PITCHBLEND, FROM WHICH THEY WOULD EXTRACT THE URANIUM, WAS SENT TO THEM FROM BOHEMIA AND KEPT IN AN ABANDONED HANGAR BELONGING TO THE MUNICIPAL SCHOOL FOR INDUSTRIAL PHYSICS AND CHEMISTRY.

"IT WAS A BARRACKS OF PLANKS, ASPHALT FLOORING AND A GLASS ROOF WITH INCOMPLETE PROTECTION FROM THE RAIN, DEVOID OF ANY FURNISHINGS. AT TIMES, I PROCESSED TWENTY KILOS OF MATTER AT A TIME, WHICH RESULTED IN THE HANGAR OVERFLOWING WITH HUGE VASES FILLED WITH PRECIPITATE AND LIQUID. IT WAS EXHAUSTING WORK TRANSPORTING THE CONTAINERS, DECANTING THE LIQUIDS AND STIRRING THE BOILING MATTER FOR HOURS IN A CAST IRON BASIN, USING A METAL ROD."

IN 1902, AFTER THREE YEARS OF HARD WORK, MARIE AND PIERRE WERE ABLE TO ISOLATE 1/10TH OF A GRAM OF PURE RADIUM FROM ONE TON OF PITCHBLEND.

THE CURIES DISCOVERED THAT PURE RADIUM IS ONE MILLION TIMES MORE RADIOACTIVE THAN URANIUM. THUS, BY DETERMINING ITS ATOMIC WEIGHT, THEY PROVIDED PROOF THAT RADIUM WAS A NEW ELEMENT.



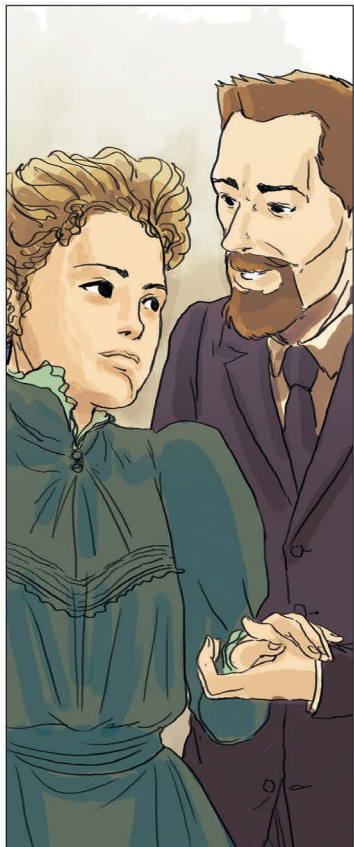
"ONE OF OUR GREAT JOYS WAS TO GO INTO OUR LAB AT NIGHT, WHERE, FROM ALL SIDES, WE WOULD SEE THE FAINTLY LUMINOUS SILHOUETTES OF THE BOTTLES FILLED WITH OUR PRODUCTS."

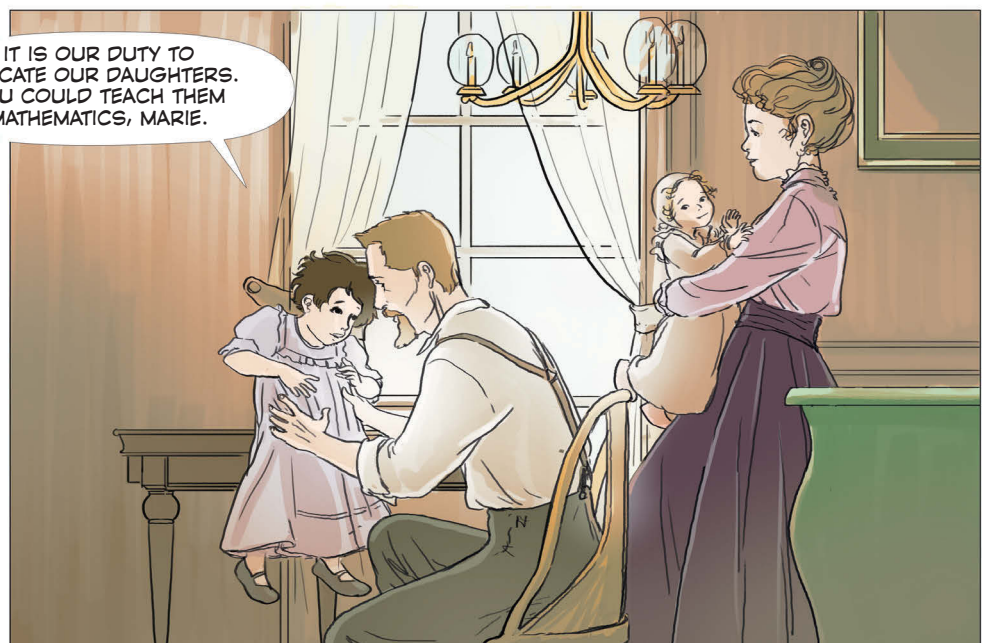
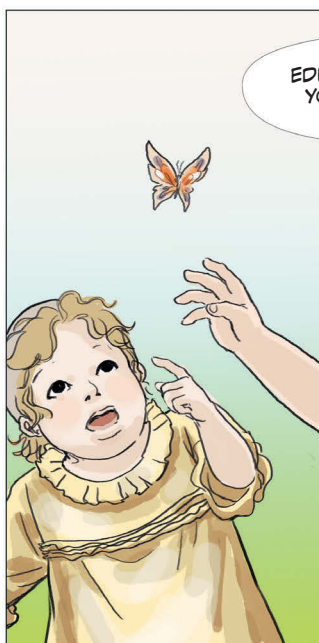
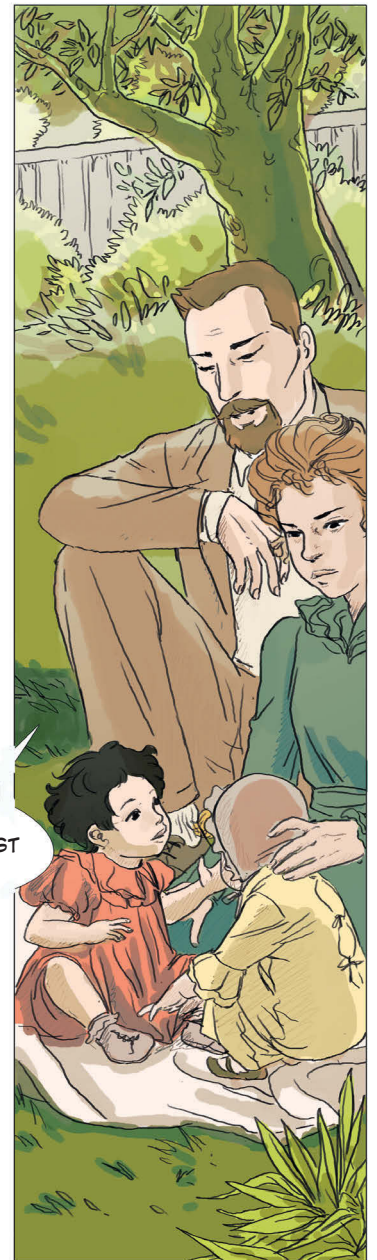
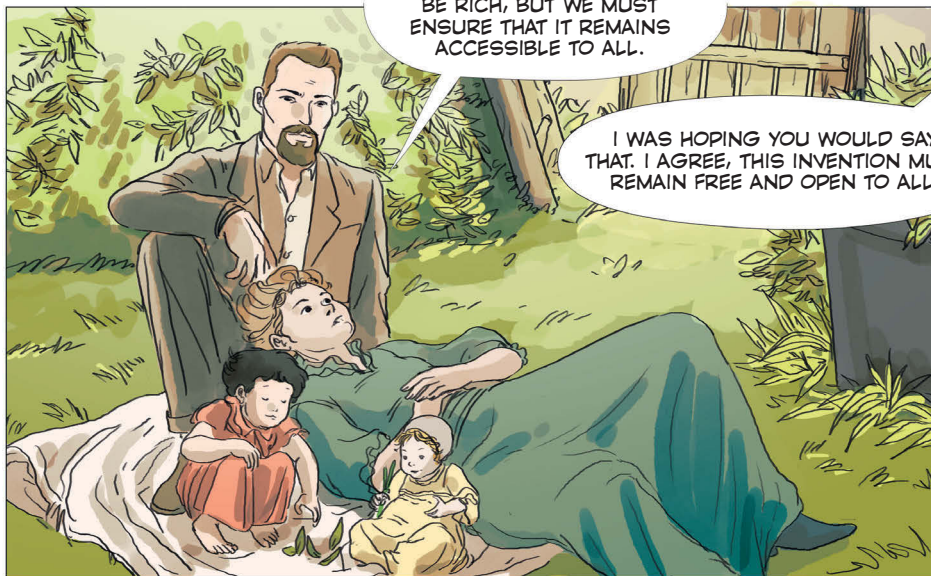
MARIE PRESENTED HER DOCTORAL THESIS IN PHYSICAL SCIENCE AT THE PARIS FACULTY OF SCIENCE ON JUNE 25, 1903. SHE TITLED IT "RESEARCH ON RADIOACTIVE SUBSTANCES BY MRS. SKŁODOWSKA-CURIE."



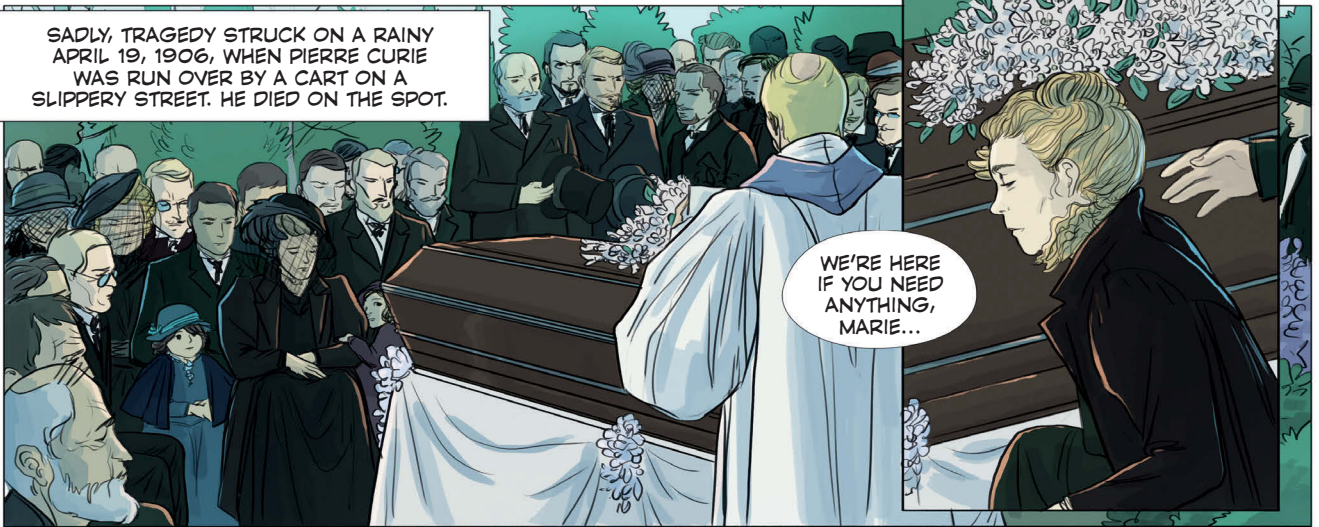
FIVE MONTHS LATER, SHE BECAME THE FIRST WOMAN TO RECEIVE A NOBEL PRIZE, IN PHYSICS, WHICH SHE SHARED WITH PIERRE CURIE AND HENRI BECQUEREL, FOR THE DISCOVERY OF RADIOACTIVITY.

THAT SAME YEAR, SHE ALSO BECAME THE FIRST WOMAN TO WIN THE DAVY MEDAL, AWARDED BY THE ROYAL SOCIETY OF LONDON.





SADLY, TRAGEDY STRUCK ON A RAINY APRIL 19, 1906, WHEN PIERRE CURIE WAS RUN OVER BY A CART ON A SLIPPERY STREET. HE DIED ON THE SPOT.

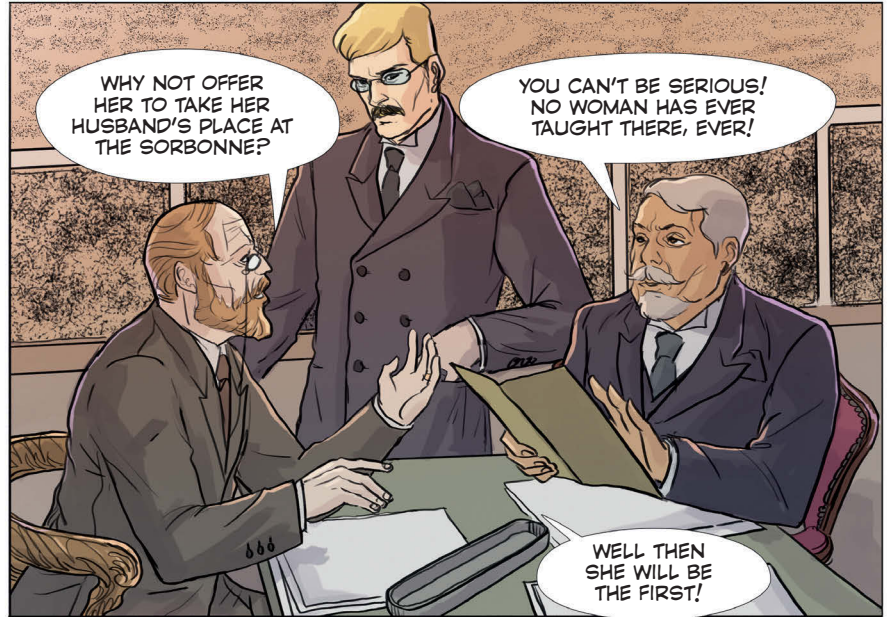


MINISTER, WE MUST HELP MARIE CURIE, PIERRE CURIE'S WIDOW.



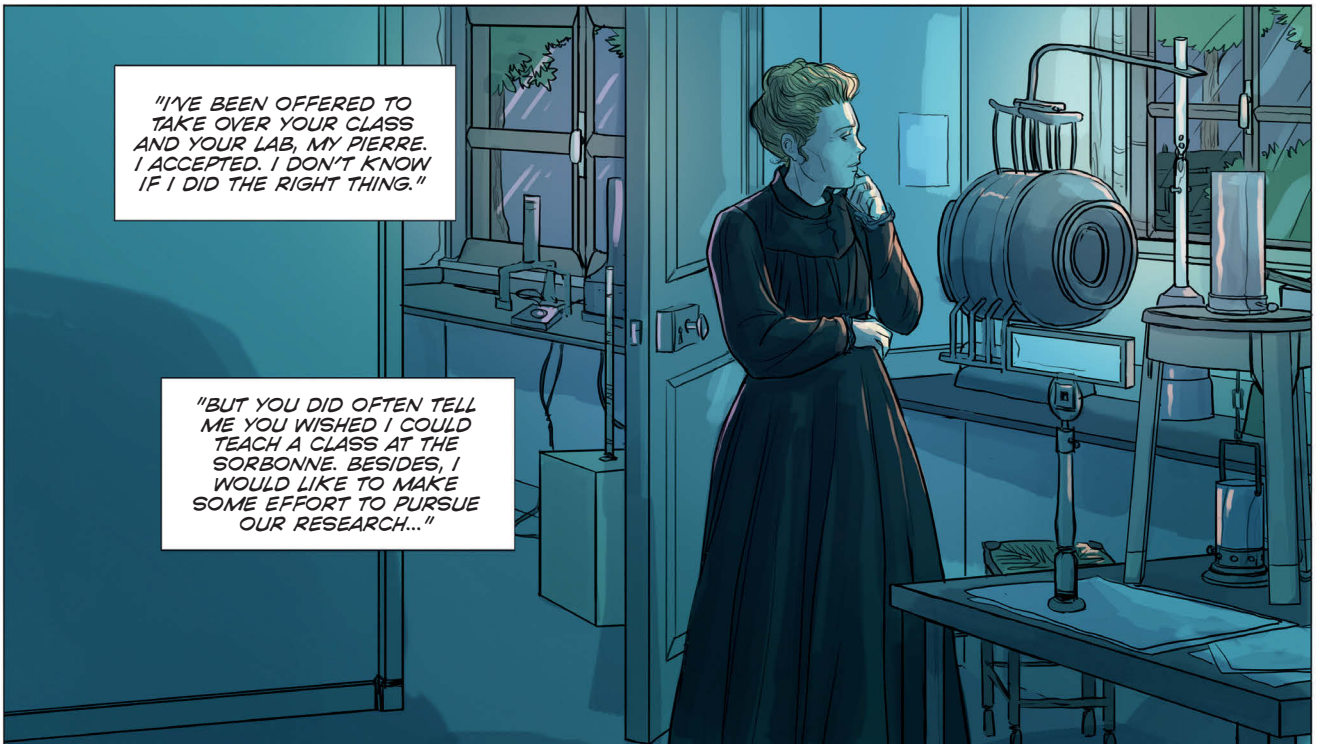
WHY NOT OFFER HER TO TAKE HER HUSBAND'S PLACE AT THE SORBONNE?

YOU CAN'T BE SERIOUS! NO WOMAN HAS EVER TAUGHT THERE, EVER!



"I'VE BEEN OFFERED TO TAKE OVER YOUR CLASS AND YOUR LAB, MY PIERRE. I ACCEPTED. I DON'T KNOW IF I DID THE RIGHT THING."

"BUT YOU DID OFTEN TELL ME YOU WISHED I COULD TEACH A CLASS AT THE SORBONNE. BESIDES, I WOULD LIKE TO MAKE SOME EFFORT TO PURSUE OUR RESEARCH..."



NOVEMBER 5, 1906. PHYSICS AUDITORIUM
AT THE SORBONNE'S FACULTY OF SCIENCE.

THE PLACE IS
FILLED WITH CURIOUS
ONLOOKERS. THERE'S
HARDLY ANY ROOM FOR
US STUDENTS!

YEP, WE HAVE
JOURNALISTS, ARTISTS,
POLITICIANS, AND
SCIENTISTS, OF COURSE...
EVERYONE'S HERE.

I CAN'T HEAR
ANYTHING!

SHE
HASN'T EVEN
MENTIONED
PIERRE!

SHUSH!

SHE PICKED UP
RIGHT WHERE HE
LEFT OFF! WHAT
A WOMAN!

SHUSH!

QUIET, SHE'S
AMAZING!

...WHEN ONE CONSIDERS
ALL THE PROGRESS MADE
IN PHYSICS THESE
PAST TEN YEARS...

...ONE CAN BE
DAZZLED BY
THE NEW IDEAS
REGARDING
ELECTRICITY AND
MATTER...



FIVE YEARS LATER.

PAUL!*
WHAT A
SURPRISE!



I'VE COME TO TAKE YOU
TO DINNER, MARIE! HOW
ABOUT A BREAK?

I DON'T THINK
THAT'S POSSIBLE,
PAUL. MY WORK--



OH, I'M SURE YOU CAN TAKE
ONE NIGHT OFF! THE LAB
IS IN GOOD HANDS.

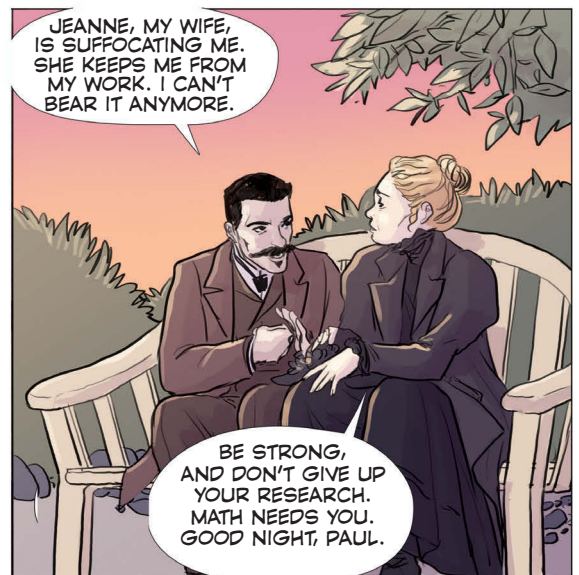
THAT IS
MADAME CURIE'S
DECISION.



HE'S PRESENT IN
EVERYTHING I DO. WE
LOVED EACH OTHER. IT'S
SO UNFAIR!



DO YOU STILL
THINK ABOUT PIERRE
A LOT?



JEANNE, MY WIFE,
IS SUFFOCATING ME.
SHE KEEPS ME FROM
MY WORK. I CAN'T
BEAR IT ANYMORE.

BE STRONG,
AND DON'T GIVE UP
YOUR RESEARCH.
MATH NEEDS YOU.
GOOD NIGHT, PAUL.



WHERE WERE YOU?
WITH WHO? WHO'S
THE HUSSY YOU'RE
SEEING?

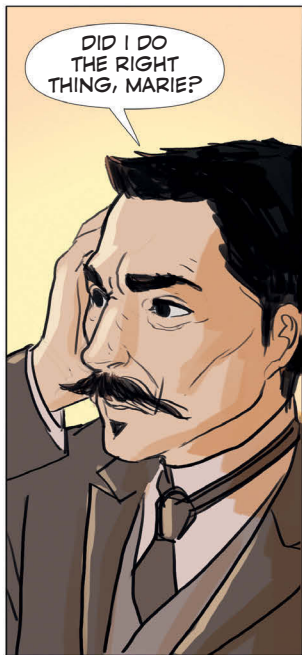
WILL YOU
SHUT UP!!

IS IT BECAUSE I'M
NOT EDUCATED? YOU'LL
PAY FOR THIS! YOU HAVE
FOUR CHILDREN, PAUL!!
AND I'M YOUR WIFE!

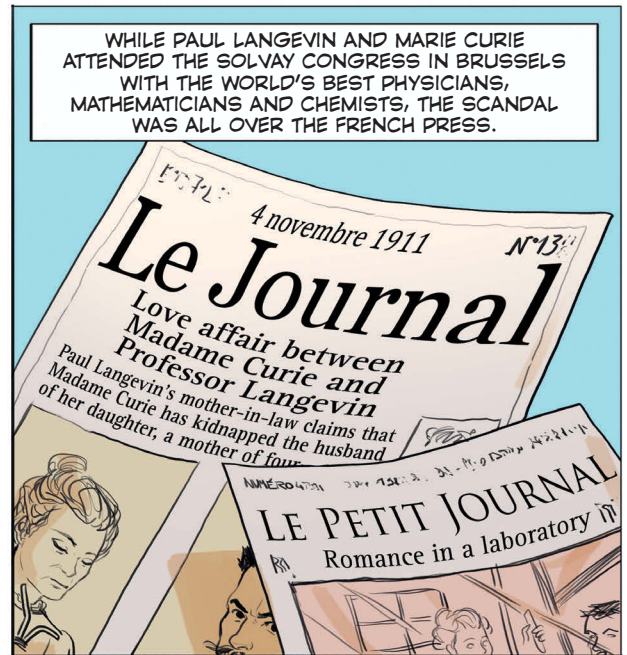
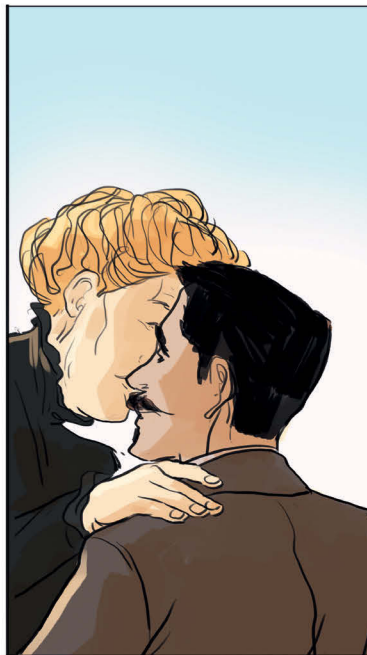


PAUL!
DON'T DO
THIS!

* PAUL LANGEVIN, AN OLD FRIEND OF THE CURIES, A FRENCH PHYSICIST AND PHILOSOPHER KNOWN FOR HIS WORK ON MAGNETISM AND FOR INTRODUCING EINSTEIN'S WORK TO FRANCE.



DID I DO THE RIGHT THING, MARIE?

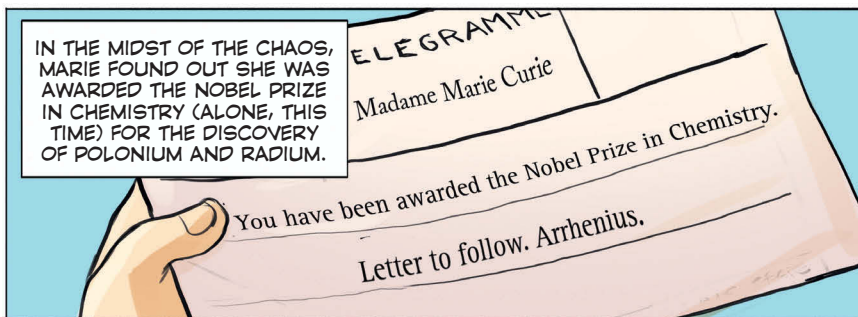


WHILE PAUL LANGEVIN AND MARIE CURIE ATTENDED THE SOLVAY CONGRESS IN BRUSSELS WITH THE WORLD'S BEST PHYSICIANS, MATHEMATICIANS AND CHEMISTS, THE SCANDAL WAS ALL OVER THE FRENCH PRESS.



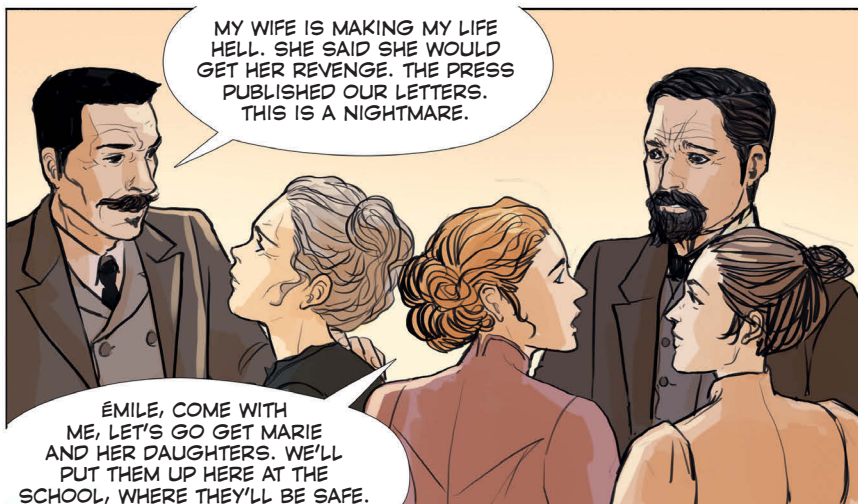
NO, I HAVE NOT KIDNAPPED ANYONE. I CONSIDER ANY VIOLATION OF PRIVACY BY THE PRESS AN ABOMINATION.

THIS VIOLATION IS PARTICULARLY CRIMINAL WHEN IT CONCERNS PEOPLE WHO HAVE CLEARLY DEVOTED THEIR LIVES TO HIGHER PREOCCUPATIONS THAT PROMOTE THE PUBLIC INTEREST.



IN THE MIST OF THE CHAOS, MARIE FOUND OUT SHE WAS AWARDED THE NOBEL PRIZE IN CHEMISTRY (ALONE, THIS TIME) FOR THE DISCOVERY OF POLONIUM AND RADIUM.

You have been awarded the Nobel Prize in Chemistry.
Letter to follow. Arrhenius.



MY WIFE IS MAKING MY LIFE HELL. SHE SAID SHE WOULD GET HER REVENGE. THE PRESS PUBLISHED OUR LETTERS. THIS IS A NIGHTMARE.

ÉMILE, COME WITH ME, LET'S GO GET MARIE AND HER DAUGHTERS. WE'LL PUT THEM UP HERE AT THE SCHOOL, WHERE THEY'LL BE SAFE.



GIL BLAS
Marie Curie, the Polish woman, Dreyfus defender and home wrecker in a France rife with immigration destroying and dishonoring

L'INTRANSIGEANT
23 NOVEMBRE



I HOPE
IT GOES
WELL.

HAVE FAITH
IN YOUR
MOTHER.

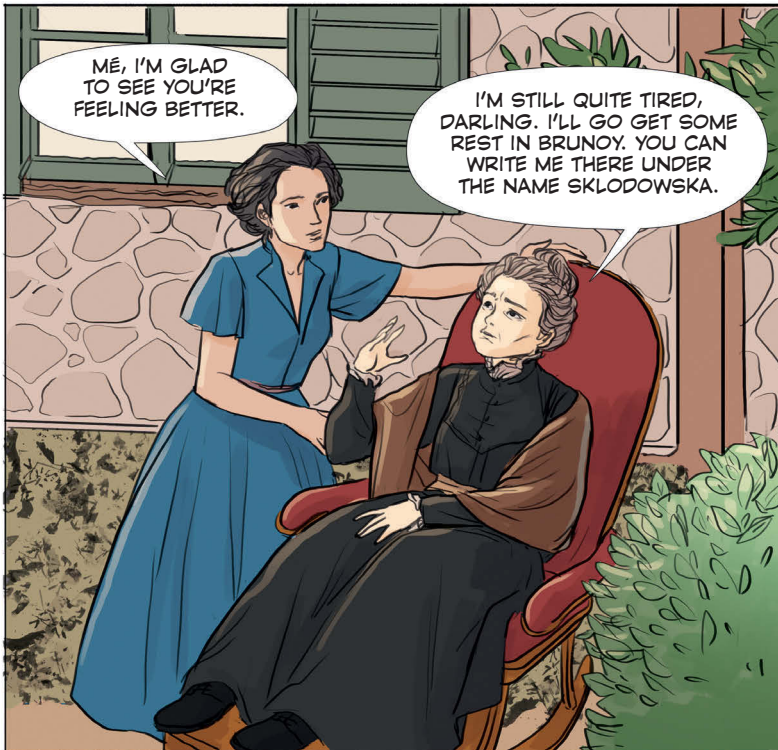
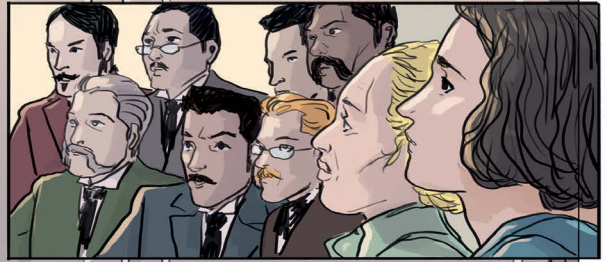
AGAINST THE ADVICE OF FRIENDS WHO
ENCOURAGED HER TO POSTPONE HER
TRIP TO STOCKHOLM UNTIL HER NAME
WAS CLEARED, MARIE JOURNEYED
THERE WITH IRÈNE, HER OLDEST
DAUGHTER, AND HER SISTER BRONIA.



FIFTEEN YEARS AGO, THE
RADIOACTIVITY OF URANIUM WAS
DISCOVERED BY HENRI BECQUEREL, AND
TWO YEARS LATER, THE STUDY OF THIS PHENOMENON
WAS EXPANDED TO OTHER SUBSTANCES, FIRST BY
MYSELF AND THEN BY PIERRE CURIE.

I CALLED ALL BODIES EMITTING SUCH
ACTIVITY "RADIOACTIVE."

THE STORY OF THE DISCOVERY
AND ISOLATION OF RADIUM PROVED THE
THEORY I HAD ARTICULATED, WHEREBY RADIO-
ACTIVITY IS AN ATOMIC PROPERTY OF MATTER
AND CAN PROVIDE A METHOD OF
RESEARCH WITH NEW
ELEMENTS.



MÉ, I'M GLAD
TO SEE YOU'RE
FEELING BETTER.

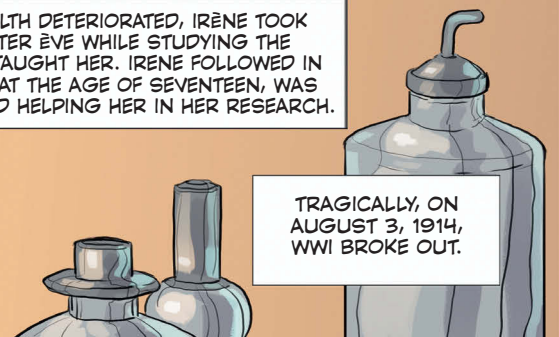
I'M STILL QUITE TIRED,
DARLING. I'LL GO GET SOME
REST IN BRUNOY. YOU CAN
WRITE ME THERE UNDER
THE NAME SKŁODOWSKA.




THE LAB WILL
HAVE TO WAIT. I
NEED TIME TO RECOVER
FROM ALL THIS
NEGATIVE PUBLICITY...
AND FROM THIS
SECOND NOBEL
PRIZE!




LATER, AS HER MOTHER'S HEALTH DETERIORATED, IRÈNE TOOK
CARE OF HER YOUNGER SISTER ÈVE WHILE STUDYING THE
SUBJECTS HER PARENTS HAD TAUGHT HER. IRÈNE FOLLOWED IN
THEIR FOOTSTEPS AND SOON, AT THE AGE OF SEVENTEEN, WAS
WORKING WITH HER MOTHER AND HELPING HER IN HER RESEARCH.



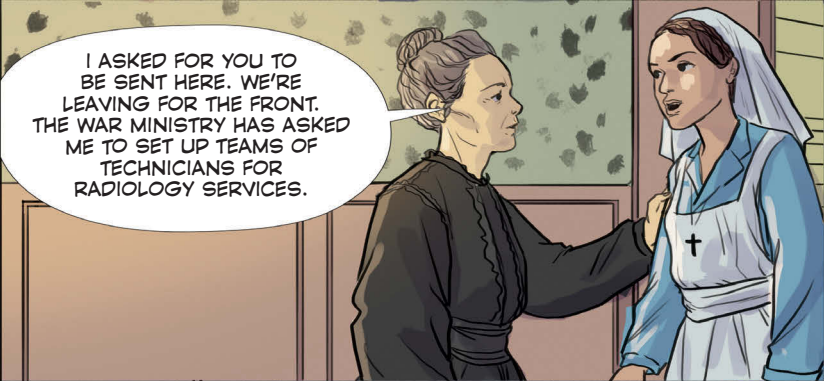
TRAGICALLY, ON
AUGUST 3, 1914,
WWI BROKE OUT.




"MY DARLING IRÈNE, KEEP WATCHING OVER YOUR SISTER. I DON'T WANT YOU TO COME TO PARIS FOR THE TIME BEING."



"I'M LEAVING FOR BORDEAUX, SO I CAN STORE MY GRAM OF RADIUM IN A SAFE PLACE, AT THE FACULTY OF SCIENCE."



I ASKED FOR YOU TO BE SENT HERE. WE'RE LEAVING FOR THE FRONT. THE WAR MINISTRY HAS ASKED ME TO SET UP TEAMS OF TECHNICIANS FOR RADIOLOGY SERVICES.




WE HAVE A LEGENDRE DYNAMO 110 VOLTS/ 14 AMPS, THE DAULT X-RAY MACHINE, PHOTOGRAPHIC EQUIPMENT, AND A GAFFE TABLE WITH LIGHT BULBS.

A comic panel showing two men in a car. The man on the left, wearing a dark hooded cloak and a cap, is looking out the window. The man on the right, with a beard and wearing a light blue coat, is driving. They are in a war-torn landscape with barbed wire and ruins in the background.

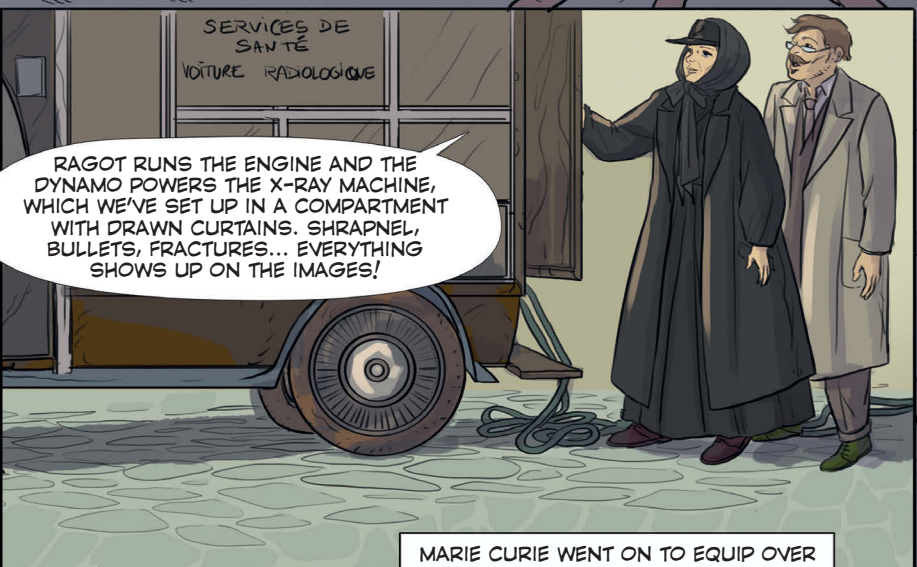
THIS CAR DOESN'T
GO VERY FAST,
MONSIEUR RAGOT!

WE'RE DOING 50/KM
AN HOUR, MADAME
CURIE, THAT'S THE
FASTEST IT CAN GO!

A comic panel showing the two men standing in a trench. The man in the light blue coat is gesturing with his hand to his head. The man in the dark cloak is looking at him.

I DON'T UNDER-
STAND, MADAME CURIE...
HOW DOES THIS
THING WORK?

COME AND SEE
FOR YOURSELF.

A comic panel showing a mobile radiology unit, a small truck with a compartment. Two men are standing next to it. The compartment has a sign that reads "SERVICES DE SANTÉ VOITURE RADIOLOGIQUE".

RAGOT RUNS THE ENGINE AND THE
DYNAMO POWERS THE X-RAY MACHINE,
WHICH WE'VE SET UP IN A COMPARTMENT
WITH DRAWN CURTAINS. SHRAPNEL,
BULLETS, FRACTURES... EVERYTHING
SHOWS UP ON THE IMAGES!

MARIE CURIE WENT ON TO EQUIP OVER
TWO HUNDRED STATIONARY OR MOBILE
RADIOLOGY UNITS, AND MORE THAN
ONE MILLION WOUNDED WERE SAVED.



IN 1933, MARIE CURIE'S HEALTH CONTINUED TO DETERIORATE AND SHE RARELY VISITED THE LAB. BUT IRÈNE WAS TAKING OVER.

FREDERIC,
LISTEN!

KRR
KRR
KRR

IT SOUNDS LIKE
WE REALLY FOUND
SOMETHING.

LET'S GO
GET ME.

I IRRADIATE THIS TARGET
WITH ALPHA RAYS FROM
MY SOURCE; YOU CAN HEAR
THE GEIGER-MULLER
COUNTER CLICK.

I TAKE AWAY
THE ALPHA SOURCE.
THEORETICALLY, THE
CLICKING SHOULD STOP.

BUT IT
DOESN'T
...

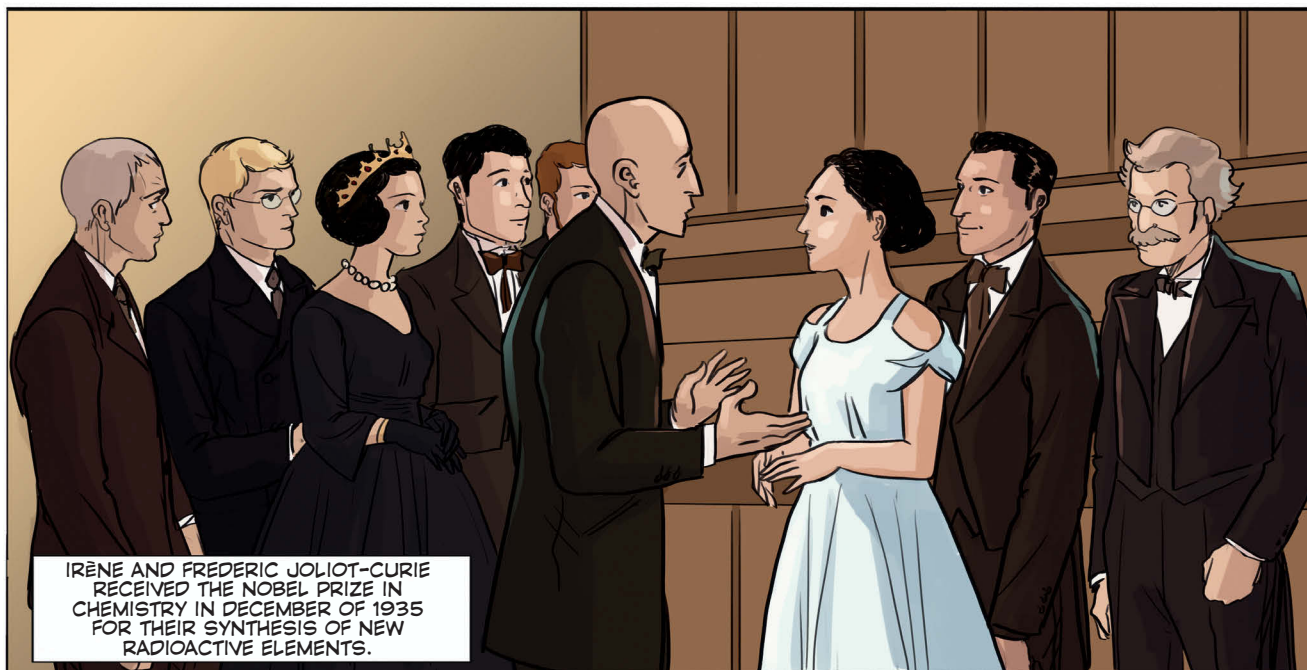
KRR
KRR
KRR

IT'S INCREDIBLE... IT'S
RADIOACTIVITY... BUT IT'S
ARTIFICIAL!

THIS MEAN WE
WILL BE ABLE TO
INDUCE RADIOACTIVITY
IN PREVIOUSLY STABLE
MATERIALS!

SHOW ME AGAIN!

THAT WAS THE LAST BIT OF
SCIENTIFIC ELATION FOR MARIE
CURIE, WHO PASSED AWAY
ON JULY 4, 1934.



IRÈNE AND FRÉDÉRIC JOLIOT-CURIE RECEIVED THE NOBEL PRIZE IN CHEMISTRY IN DECEMBER OF 1935 FOR THEIR SYNTHESIS OF NEW RADIOACTIVE ELEMENTS.

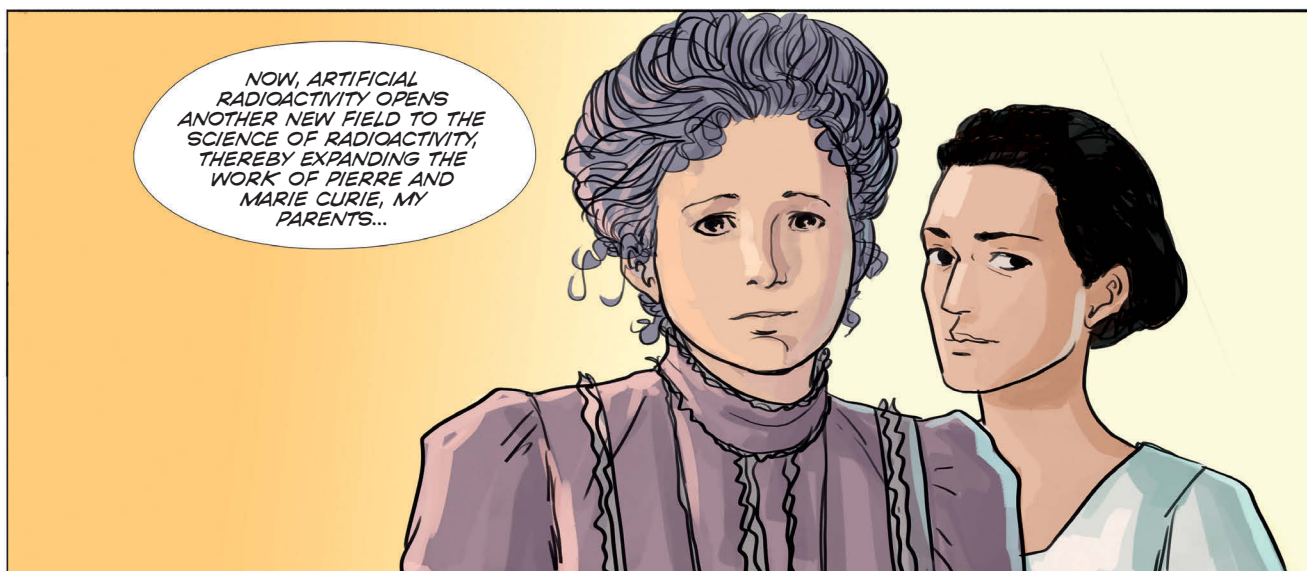
IT IS A GREAT HONOR FOR US TO BE AWARDED THE NOBEL PRIZE BY THE SWEDISH ACADEMY OF SCIENCE FOR OUR WORK ON THE SYNTHESIS OF RADIOACTIVE ELEMENTS, AFTER THE PRIZE WAS AWARDED TO PIERRE AND MARIE CURIE IN 1903, AND THEN TO MARIE CURIE IN 1911, FOR THE DISCOVERY OF RADIOACTIVE ELEMENTS.

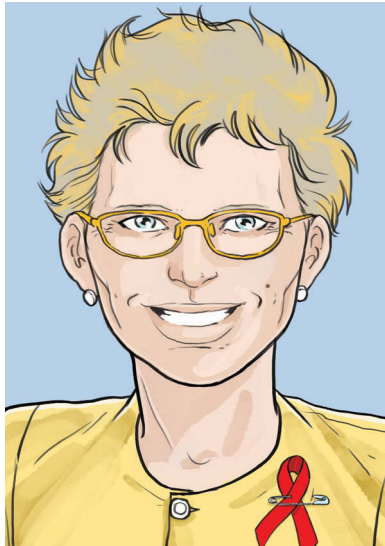


I'D LIKE TO REMIND EVERYONE HERE OF THE EXTRAORDINARY ADVANCES THAT HAVE BEEN MADE IN RADIOACTIVITY, THE NEW SCIENTIFIC FIELD DISCOVERED LESS THAN FORTY YEARS AGO THROUGH THE RESEARCH OF HENRI BECQUEREL AND PIERRE AND MARIE CURIE...



NOW, ARTIFICIAL RADIOACTIVITY OPENS ANOTHER NEW FIELD TO THE SCIENCE OF RADIOACTIVITY, THEREBY EXPANDING THE WORK OF PIERRE AND MARIE CURIE, MY PARENTS...





Françoise Barré-Sinoussi

1947 -

French virologist
Nobel Prize in Medicine 2008

An only child fascinated by all living things, **Françoise Barré-Sinoussi** spent her childhood observing the teeming life in the meadows of Auvergne.

Born into a family of modest means, she would have liked to study medicine but ultimately chose the sciences, primarily for economic reasons. She was a brilliant student, which paved her way to the United States and opened the door to prestigious laboratories, including the main one, that of Jean-Claude Chermann at the Pasteur Institute.

It was there that, in 1983, as part of Professor Montagnier's team, that she discovered HIV, the retrovirus responsible for AIDS.

In 2008, she and Luc Montagnier were awarded the Nobel Prize in medicine for this discovery.

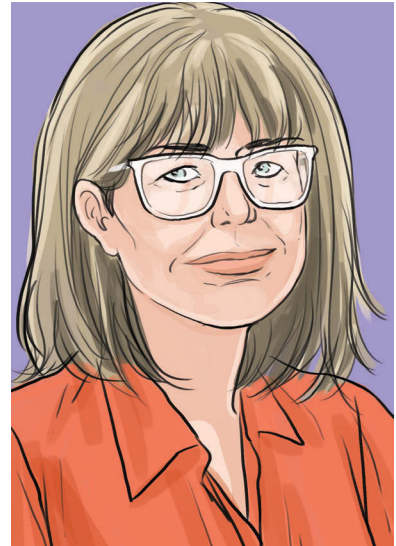
A former research director at Inserm, professor at the Institut Pasteur until 2015, president of the International AIDS Society (IAS) from 2012 to 2014, she is now a member of the French National Academy of Sciences and president of Sidaction, a French fundraising society to fight AIDS..



Donna Theo Strickland

1959 -

Canadian physicist
Nobel Prize in Physics 2018
(shared with Gérard Mourou)



Born in 1959 in Guelph, Canada, **Donna Theo Strickland** is a pioneering Canadian physicist in the field of lasers.

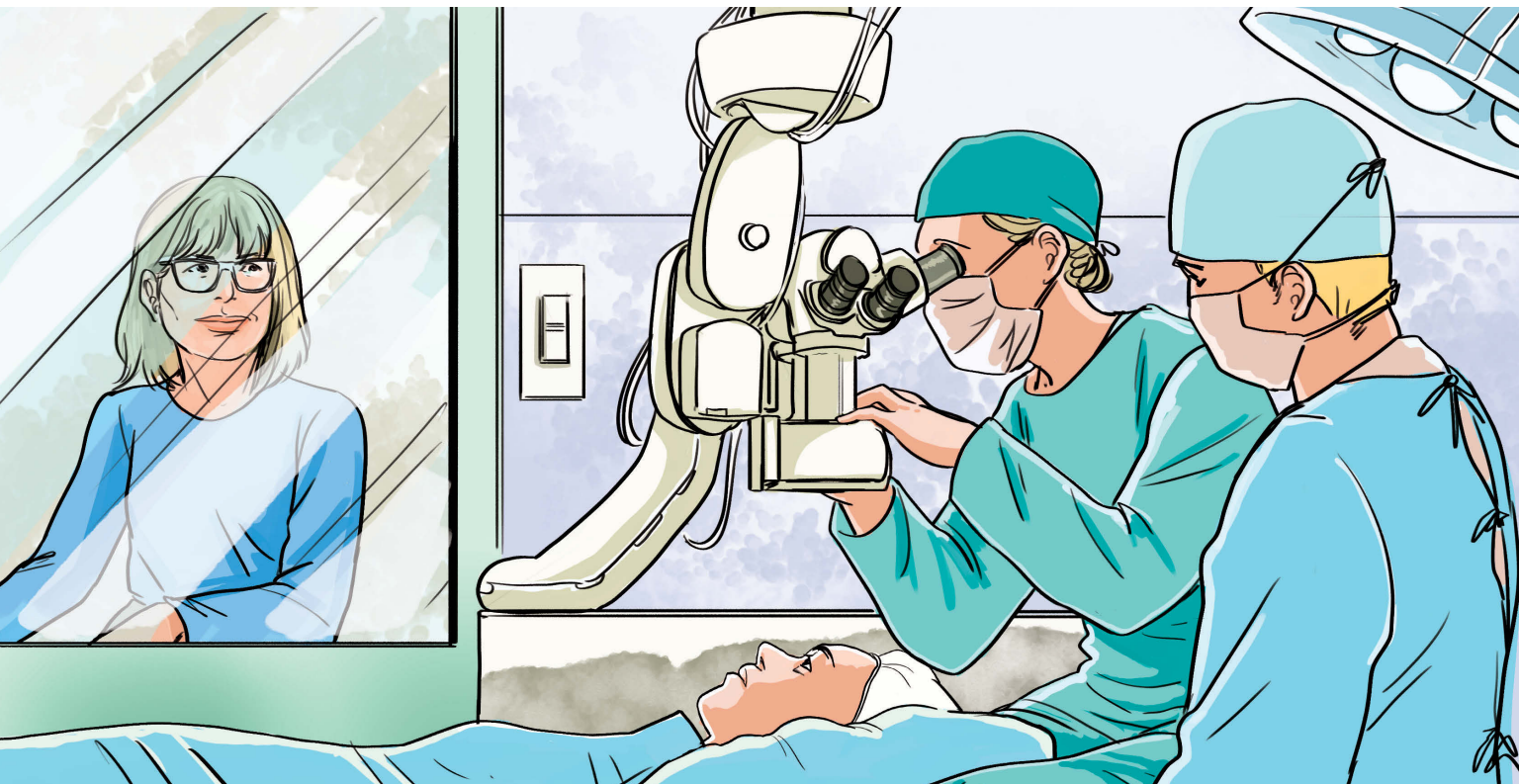
In 1982, while she was still a student, she and Professor Gerard Mourou developed a technique for amplifying pulses with lasers, which was capable of producing ultrashort pulses of high intensity without damaging the equipment. This research became the subject of a publication.

It was on the basis of that first article that she received the 2018 Nobel Prize in Physics, which she shared with Gérard Mourou, for advances in laser physics (laser technology itself was created in 1960).

She thus became the third woman to be awarded the Nobel Laureate in physics, following Marie Curie in 1903 and Maria Goeppert-Mayer in 1963.

Strickland, who was largely unknown until her Nobel win, is now a professor in the physics and astronomy department at the University of Waterloo.

Laser technique is used all over the world, especially in eye surgery.





Dorothy Vaughan

1910 - 2008

American mathematician and computer scientist
Congressional Gold Medal

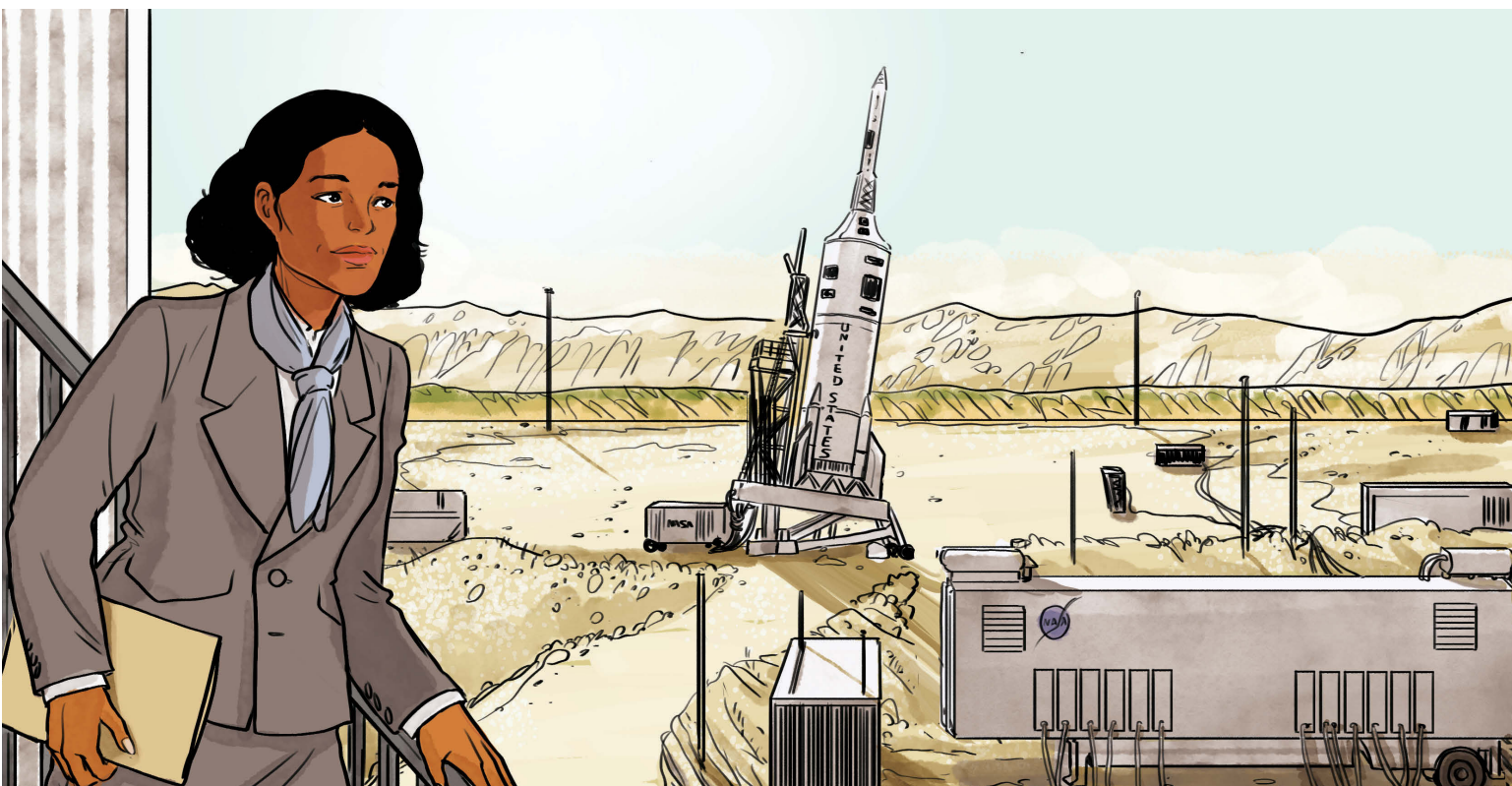
Dorothy Johnson Vaughan was born in Kansas City, Missouri in 1910. It was clear early on that she was gifted, as she successfully completed various academic courses at segregated schools in West Virginia, where her family had moved.

Torn between her family life (she was the mother of three daughters) and her teaching career in a segregated school, she ended up responding to the recruitment announcement of the NACA (which later become NASA), at the same time as Katherine Johnson (see p.54).

There, she joined the team of "computers in skirts" and went on to become the first black manager in the history of NASA when she was chosen to head up the west wing of the computer unit.

Aware of the rapid evolution of the potential of computer technology, she trained in the Fortran programming language, which enabled her to work on flight calculations with the SCOUT launch vehicle program (Solid Controlled Orbital Utility Test system), one of the most reliable launchers.

She was awarded the Congressional Gold Medal posthumously.



ADA LOVELACE



1815 - 1852

English; the inventor of computer programming

2018 - SOMEWHERE
IN FRANCE.

TODAY, YOU EACH
OWN A COMPUTER, BUT THAT
WASN'T ALWAYS THE CASE.

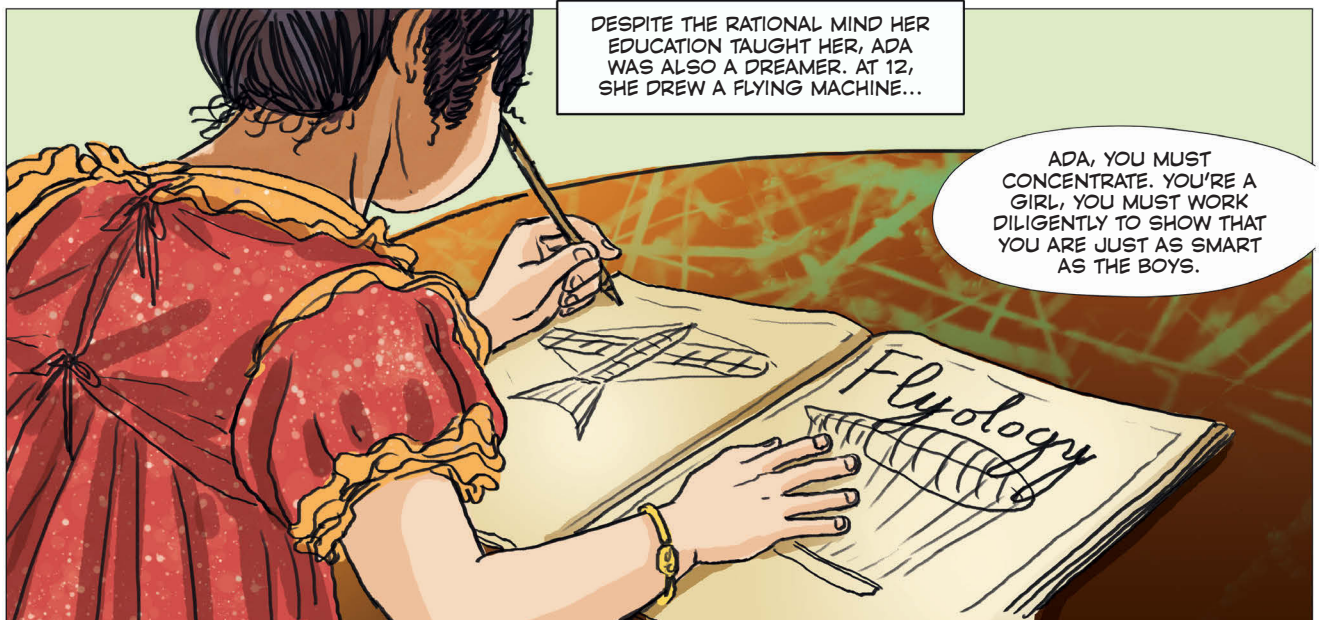
IN THE 19TH CENTURY,
A WOMAN WROTE THE FIRST
MATHEMATICAL PROGRAM THAT
INITIATED COMPUTER LANGUAGE.

COMPUTER PROGRAMMING I/BACKGROUND

TODAY, THE REASON
ONE BILLION HOMES IN
THE WORLD HAVE AT LEAST
ONE COMPUTER IS THUS IN
LARGE PART THANKS TO THIS
WOMAN, WHOSE NAME WAS
ADA LOVELACE.



AT THE AGE WHEN MOST CHILDREN LEARN TO READ, YOUNG ADA WAS LEARNING MATH AND SCIENCE, USUALLY RESERVED FOR BOYS BACK THEN. BUT HER MOTHER, A GREAT MATHEMATICIAN, WANTED HER DAUGHTER TO BE THEIR EQUAL AT EVERY LEVEL.



*ADA WAS THE DAUGHTER OF LORD BYRON, THE FAMOUS POET, WHO DIED IN THE GREEK WAR OF INDEPENDENCE.

LONDON -
1832.

AT SEVENTEEN, ADA MADE HER DEBUT IN HIGH SOCIETY AND TOOK LESSONS WITH MARY SOMERVILLE, A PROMINENT MATHEMATICIAN AND ASTRONOMER.

ADA, YOU MUST KEEP STUDYING. YOUR RESULTS ARE ENCOURAGING!

COME TO OUR SOIRÉE ON WEDNESDAY. I'LL GLADLY INTRODUCE YOU TO THE SCIENTISTS IN OUR CIRCLE. CHARLES BABBAGE WILL BE THERE. YOU'LL FIND HIS MATHEMATIC CALCULATOR PROJECT FASCINATING.

CHARLES, THIS IS MISS ADA BYRON. A YOUNG MIND WITH AN APTITUDE FOR MATHEMATICS.

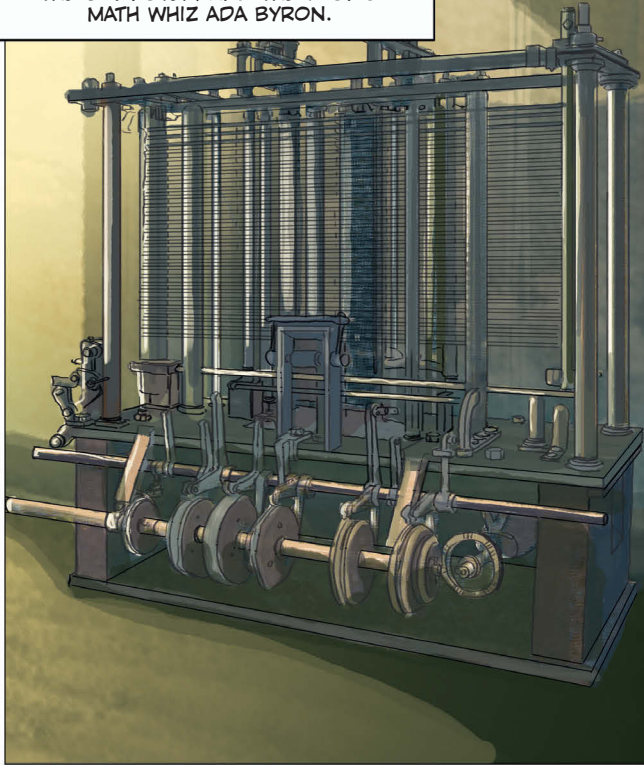
I'M CERTAIN SHE'LL ENJOY YOUR DIFFERENCE ENGINE.

PLEASURE, MISS BYRON! SO YOU'RE A MATH AFICIONADO, THEN?

INDEED I AM, SIR. I'M PASSIONATE ABOUT MATH. MY MOTHER HAS BEEN TEACHING ME SINCE I WAS A CHILD.

THEN COME AND VISIT ME NEXT WEEK! I'LL SHOW YOU MY MACHINE WHICH IS DESIGNED TO CALCULATE POLYNOMIALS. I'M SURE YOU'LL FIND IT QUITE INTERESTING!

AND THUS BEGAN A LONG AND FRUITFUL COLLABORATION BETWEEN CHARLES BABBAGE, THE FATHER OF THE COMPUTER, AND THE YOUNG MATH WHIZ ADA BYRON.



THERE ARE TOO MANY ACCIDENTS AT SEA. OUR NAUTICAL TABLES ARE RIDDLED WITH ERRORS. HUMANS ARE FALLIBLE. WE MUST FIND A WAY TO AUTOMATE CALCULATIONS WITH A MACHINE.

THAT'S THE GOAL OF YOUR DIFFERENCE ENGINE. IT WILL TAKE TIME, BUT WE'LL GET THERE!



HOWEVER, WE'LL HAVE TO ENTER DATA FOR EVERY SINGLE TYPE OF CALCULATION WE WISH TO DO.



My Dear Sir Babbage

We've encountered a problem.

If we cannot repeat our data in an automatic way, we'll be forced to put as many perforated cards into the machine as the operations we want.

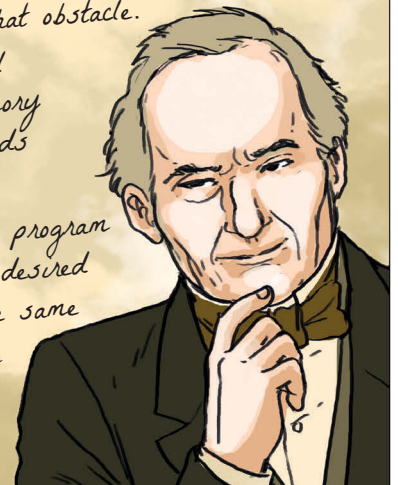


Dear Miss Byron

Indeed, and I have found a potential solution by creating a second machine to overcome that obstacle.

It's an analytical machine with a memory and perforated cards for the data.

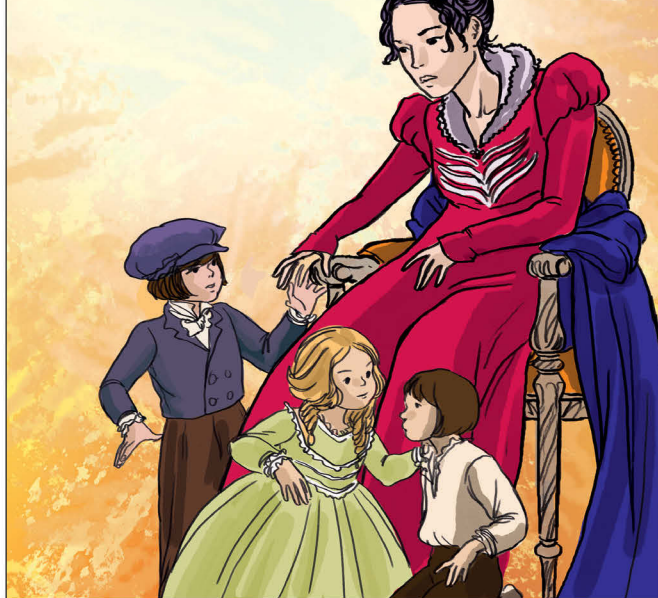
We should be able to program it to repeat, for the desired number of times, the same operation without our having to intervene between each...



IN 1835, ADA FELL IN LOVE
WITH AND MARRIED DR.
WILLIAM KING-NOEL, THE
FUTURE EARL OF LOVELACE...



...WITH WHOM SHE
HAD THREE CHILDREN:
BYRON, ANNE AND
RALPH.



AND IN
1839...

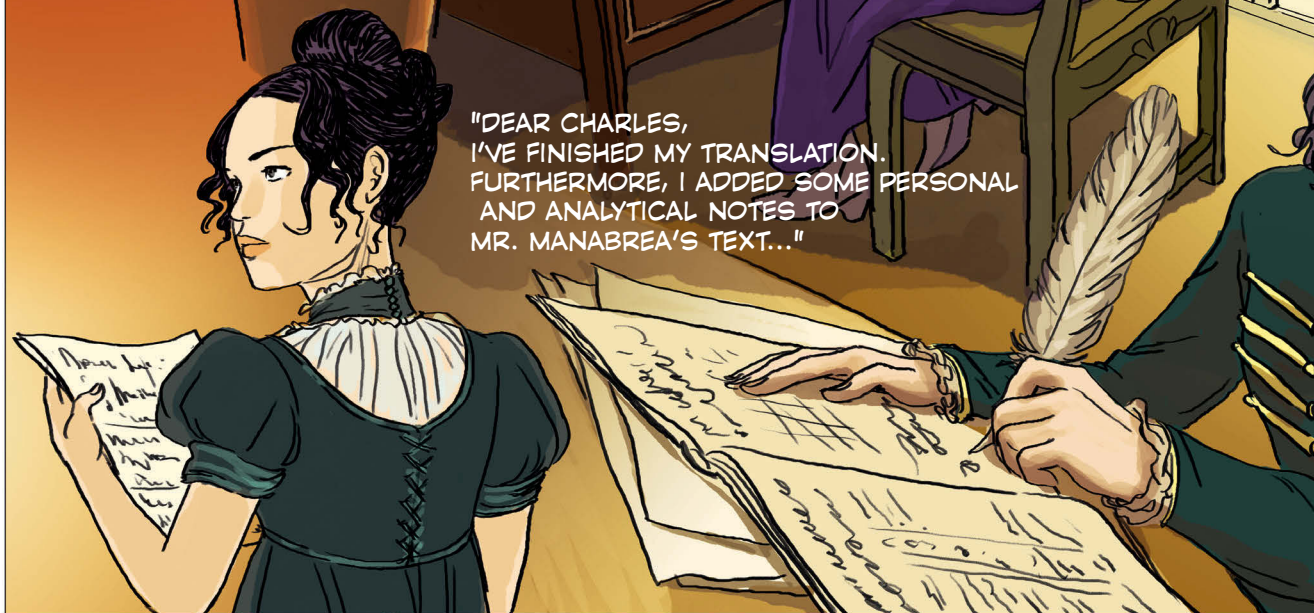
"DEAR CHARLES,

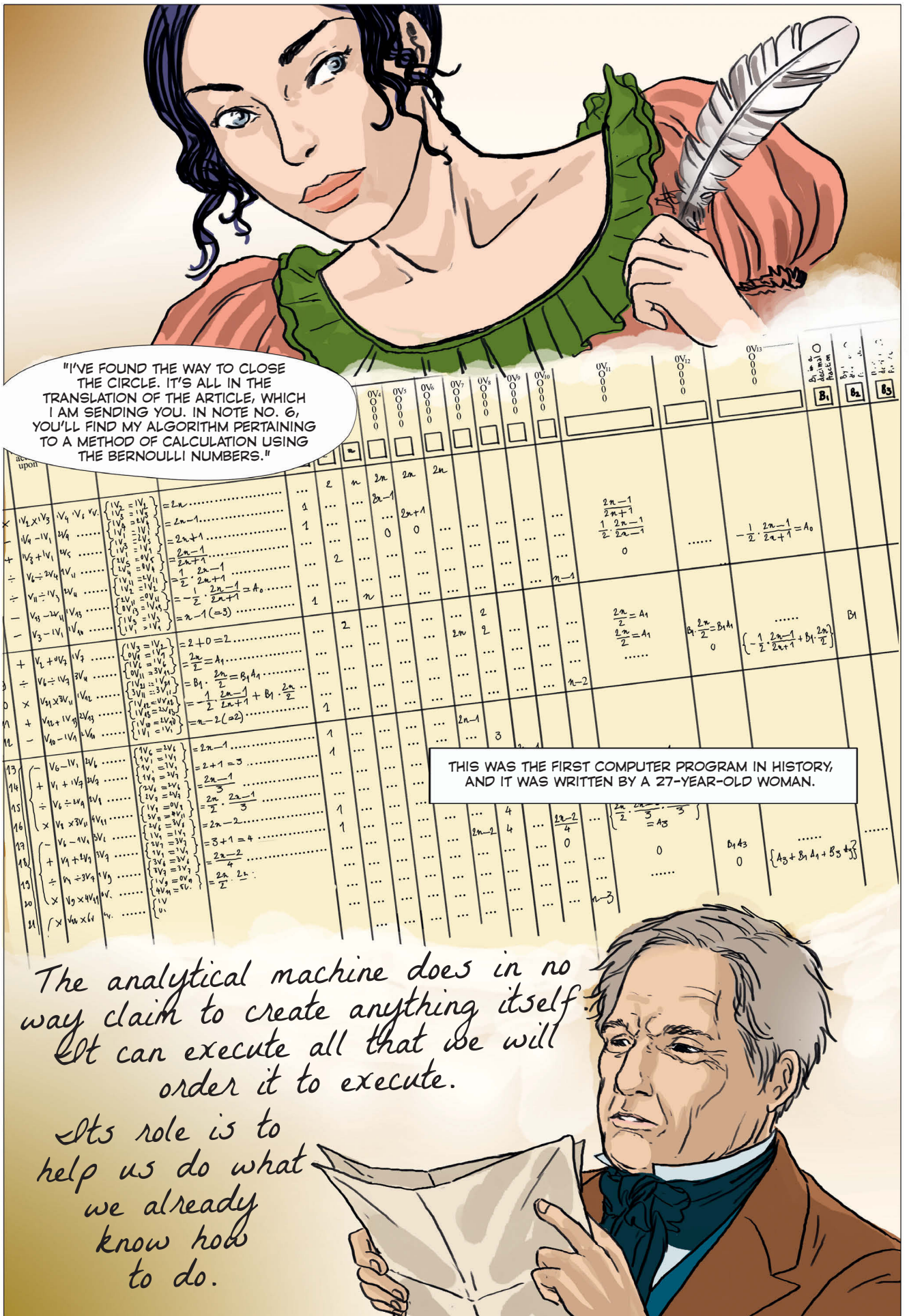
I'M READY TO RESUME MY RESEARCH.

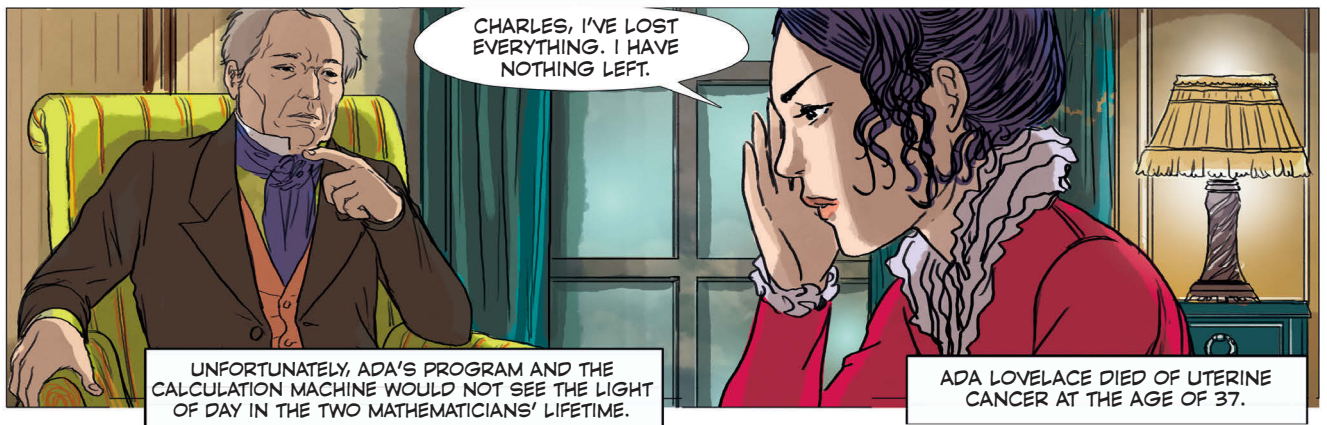
MR. CHARLES WHEATSTONE SUGGESTED I
TRANSLATE THE ARTICLE THAT LUIGI FEDERICO
MENABREA WROTE ABOUT YOUR ANALYTICAL
MACHINE PROJECT.

I GLADLY ACCEPTED. I DO SO LOVE TO WRITE AND
TO BRING A LITTLE POETRY TO MATHEMATICS."

"DEAR CHARLES,
I'VE FINISHED MY TRANSLATION.
FURTHERMORE, I ADDED SOME PERSONAL
AND ANALYTICAL NOTES TO
MR. MANABREA'S TEXT..."

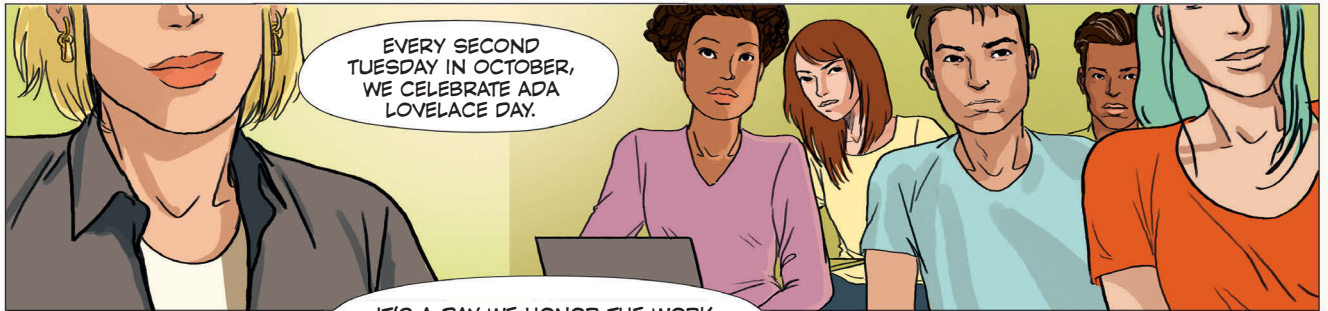




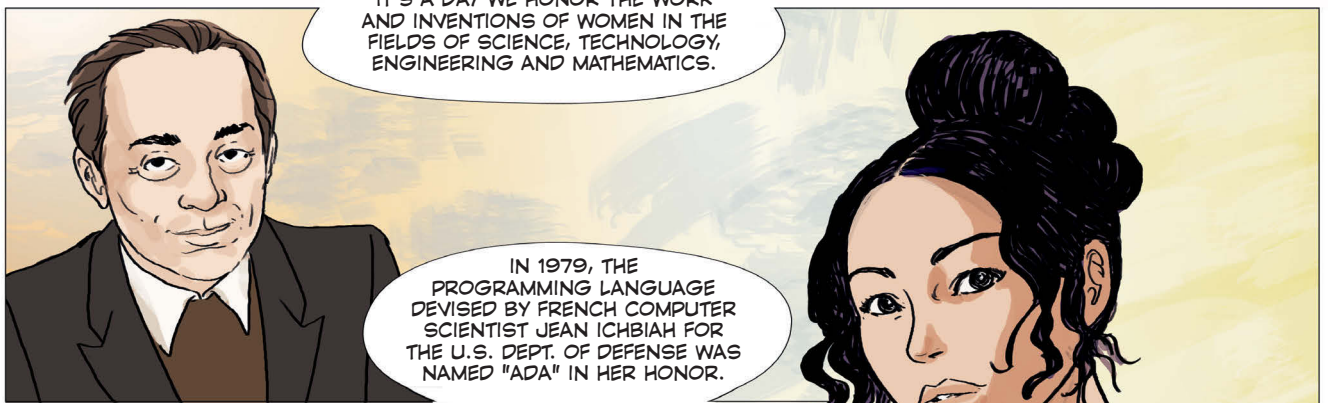




...AND IT'S BECAUSE OF HER THEORETICAL WORK THAT ADA LOVELACE IS CONSIDERED THE FIRST COMPUTER PROGRAMMER IN THE WORLD.

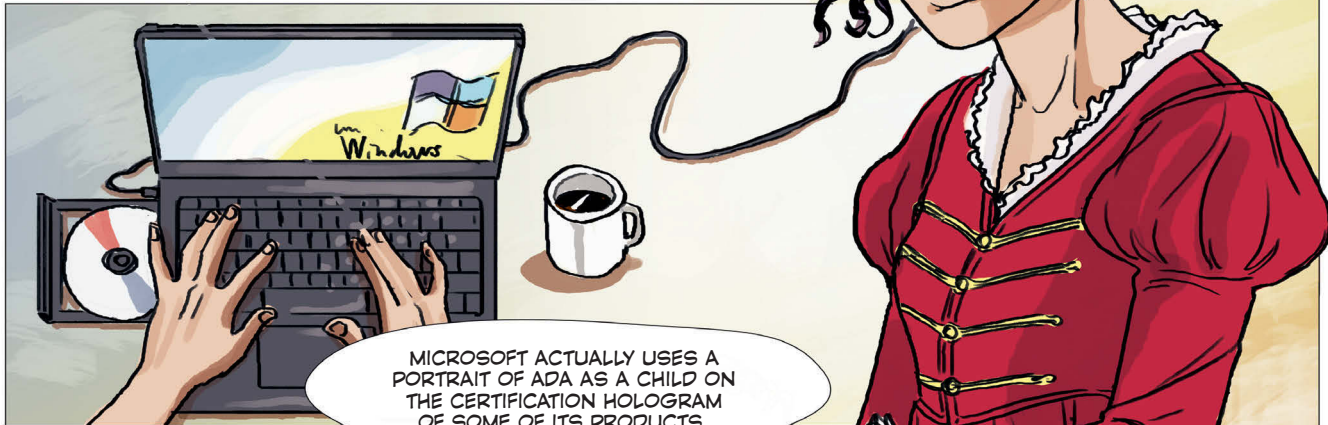


EVERY SECOND TUESDAY IN OCTOBER, WE CELEBRATE ADA LOVELACE DAY.

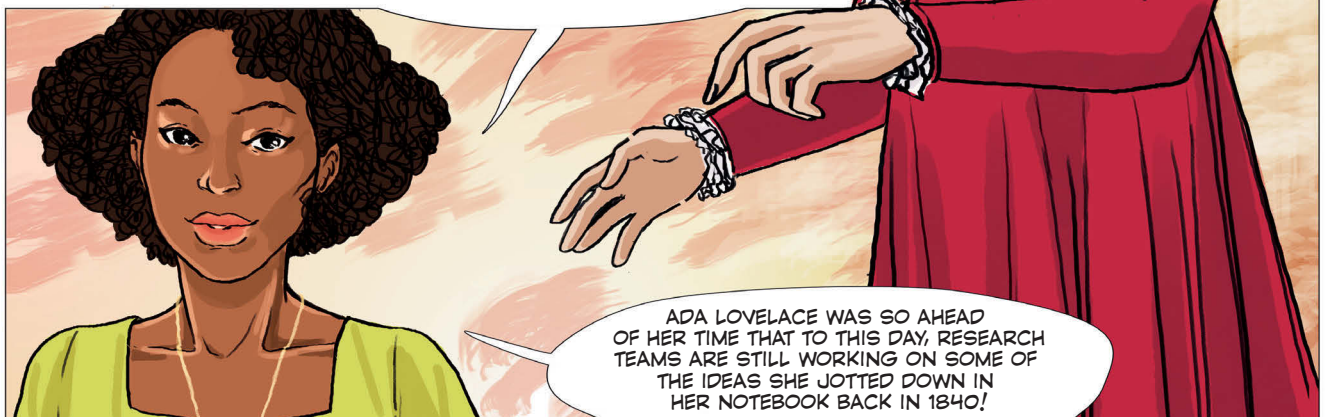


IT'S A DAY WE HONOR THE WORK AND INVENTIONS OF WOMEN IN THE FIELDS OF SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS.

IN 1979, THE PROGRAMMING LANGUAGE DEvised BY FRENCH COMPUTER SCIENTIST JEAN ICHBIAH FOR THE U.S. DEPT. OF DEFENSE WAS NAMED "ADA" IN HER HONOR.



MICROSOFT ACTUALLY USES A PORTRAIT OF ADA AS A CHILD ON THE CERTIFICATION HOLOGRAM OF SOME OF ITS PRODUCTS.



ADA LOVELACE WAS SO AHEAD OF HER TIME THAT TO THIS DAY, RESEARCH TEAMS ARE STILL WORKING ON SOME OF THE IDEAS SHE JOTTED DOWN IN HER NOTEBOOK BACK IN 1840!



Émilie du Châtelet

1706 - 1749

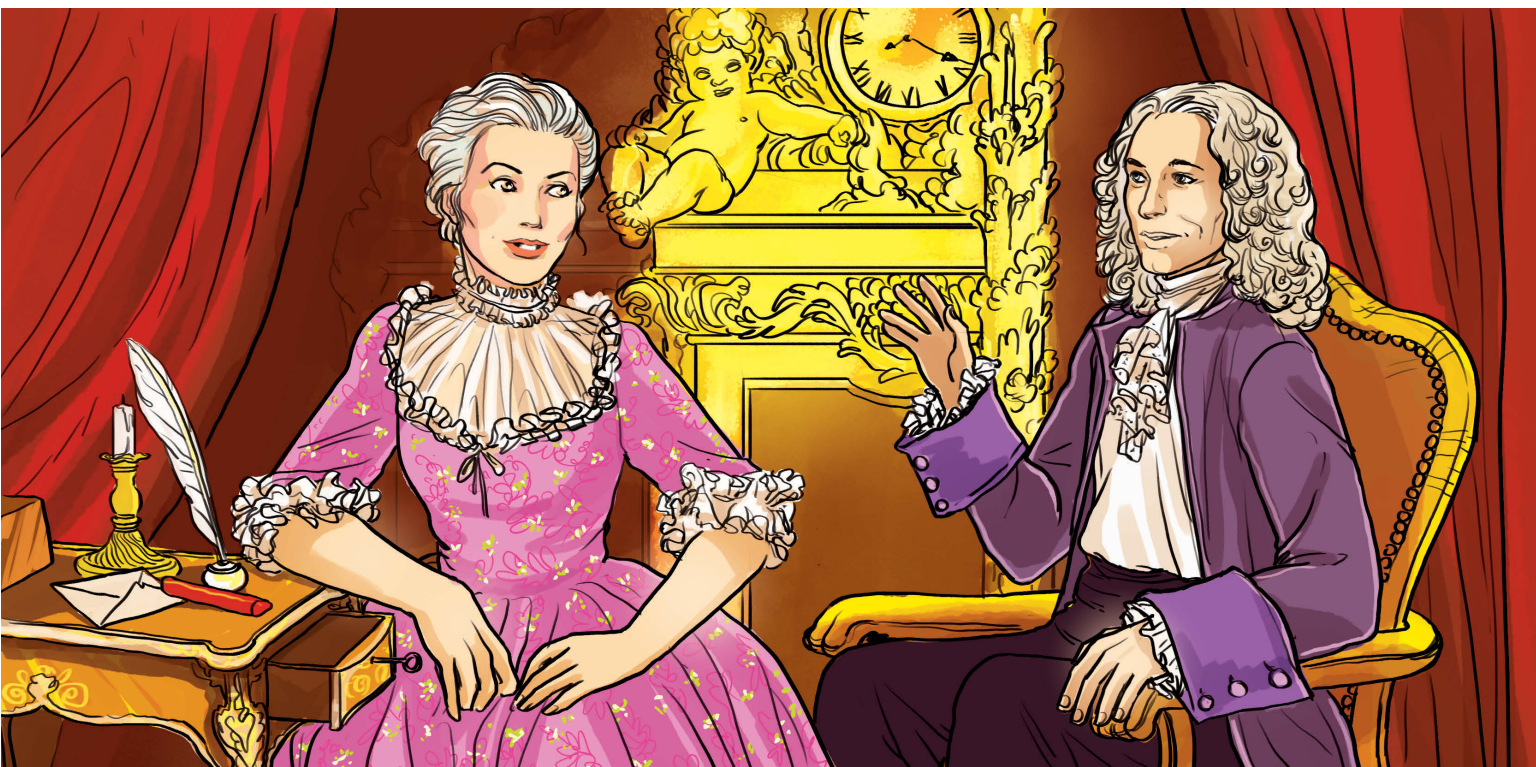
French mathematician and physicist

Gabrielle Emilie Le Tonnelier de Breteuil, Marquise du Chatelet, enjoyed a rich and intellectual education thanks to her father. He introduced her to the greatest scholars and philosophers of the time, which was quite unusual for a woman in those days.

A mathematics enthusiast, she translated Isaac Newton's *Mathematical Principles of Natural Philosophy*, which brought her immediate notoriety. Wishing to stimulate her mind in other ways besides the translation of complex formulas and principles of physics, she attended the discussions that the mathematician Maupertuis used to hold at the *Café Gradot*—for which she had to dress as a boy, as women were banned from cafés in those days.

Among her body of work is a treatise she wrote on physics, accompanied by experiments, which was published by the French Academy of Sciences, whose access was also forbidden to women back then (Yvonne Choquet-Bruhat became the first woman admitted to the Academy in...1979).

Through experiments, she demonstrated Leibniz's theories on kinetic energy. Voltaire, with whom she had a romantic liaison, encouraged her in her research.



Emmy Noether

1882 - 1935

German mathematician



Amalie Emmy Noether was born on March 23, 1882 in Erlangen (Germany).

She had a gift for languages and could have easily taught English or French after passing her exams with flying colors, but she preferred instead to embark on a mathematical course of studies at the University of Erlangen, despite it being largely inaccessible to women: out of one thousand students, only two were women.

Later, having again excelled at her studies, she went on to teach mathematics, despite resistance from her male colleagues, and she did so without status or remuneration, simply because she was a

woman. But nothing could stop her, and her classes, which emphasized oral communication and dialogue with students, earned her a special reputation.

In addition to her influence on the mathematicians of the time, she revolutionized the field, and algebra in particular. The theorem in her paper Theory of Ideals in Ring Domains, later called Noether's Theorem, was met with great enthusiasm by researchers.

Albert Einstein called her "The most important creative mathematical genius produced since women gained access to higher education."





Grace Alele-Williams

1932 -

Nigerian Mathematician

Born in 1932 in Niger, **Grace Alele-Williams** studied in Warri and then in Lagos before going to the U.S., where she earned her doctorate in mathematics at the University of Chicago in 1963.

The first Nigerian woman to obtain such a diploma, she then returned to her country, and went on to become head of the University of Benin and the first woman to hold such a high-level, decision-making position.

Her passion for mathematics led her to teaching, which she would continue to do her whole life. As a committed advocate for women's rights, she was particularly dedicated to teaching women.

She has been a member of the African Commission on Mathematics and Vice-President of the Third World Organization for Women in Science.

As part of her struggle on behalf of women's rights, she launched new programs that allow older women working as teachers in elementary schools to receive certification. Whenever she has the chance, she expresses her wish to see many more women in scientific fields and in positions of power.

She is a recipient of the Order of the Niger merit award.



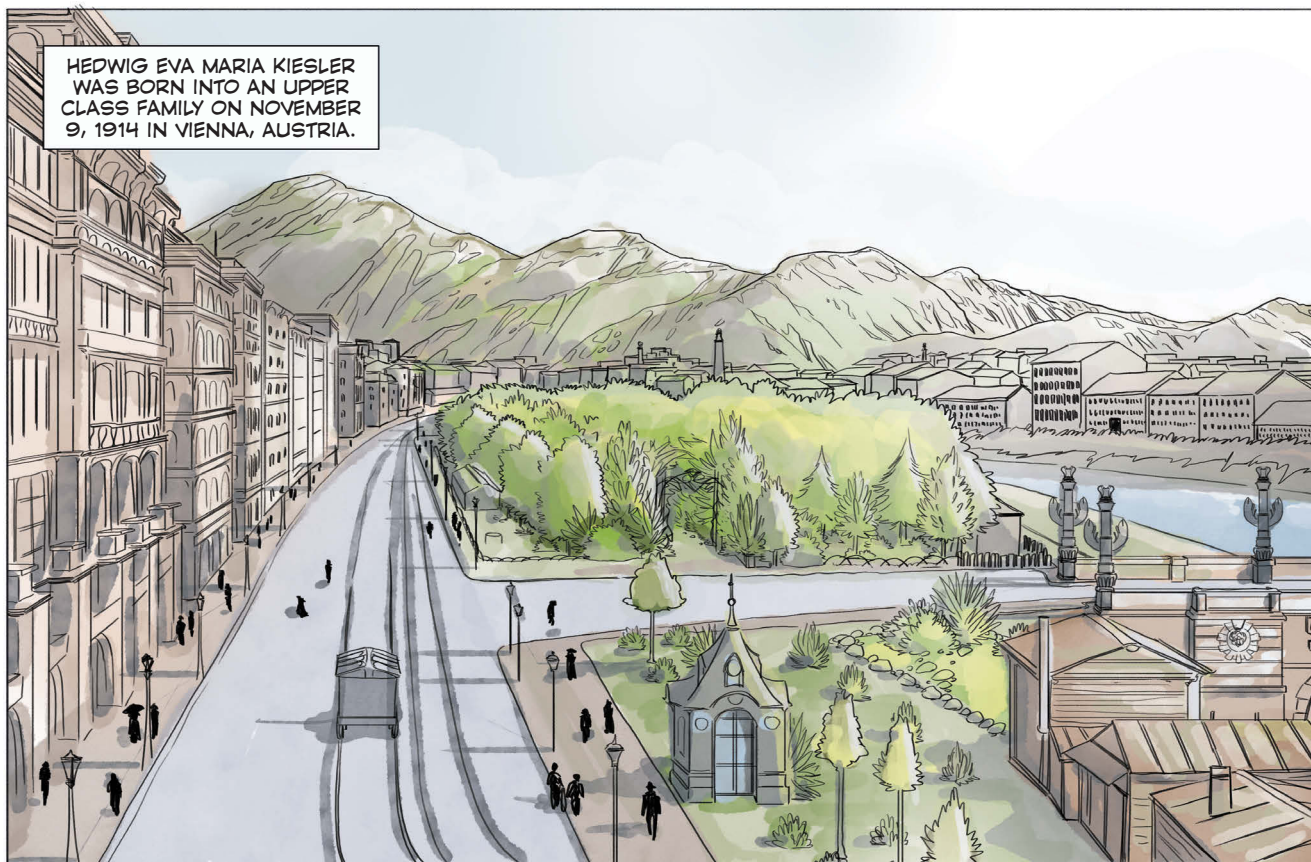
HEDY LAMARR



1914 - 2000

Austrian-American pioneer in transmission methods.
Pioneer Trophy from the *Electronic Frontier Foundation* in 1997,
shared with George Antheil.

HEDWIG EVA MARIA KIESLER
WAS BORN INTO AN UPPER
CLASS FAMILY ON NOVEMBER
9, 1914 IN VIENNA, AUSTRIA.



HER FATHER, EMIL KIESLER,
WAS A JEWISH BANKER.

HER MOTHER WAS BORN JEWISH BUT
CONVERTED TO CATHOLICISM. SHE
WAS A CONCERT PIANIST WHO TAUGHT
MUSIC AND DANCE TO HER DAUGHTER.

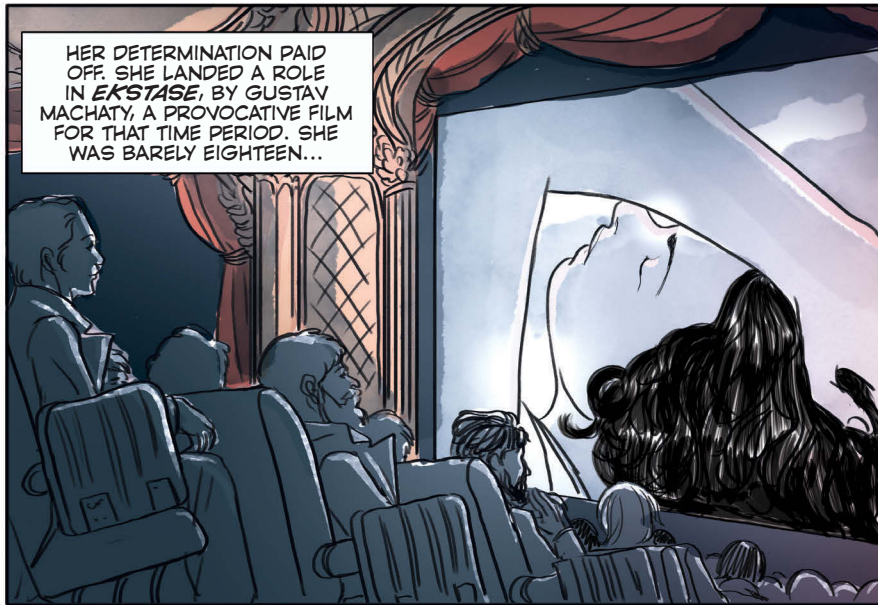


THE BEAUTIFUL HEDWIG
WAS BORED. SHE WANTED
TO ACT AND SKIPPED
CLASS TO WORK FOR A
VIENNESE FILM STUDIO.



I WANT TO BE AN
ACTRESS!





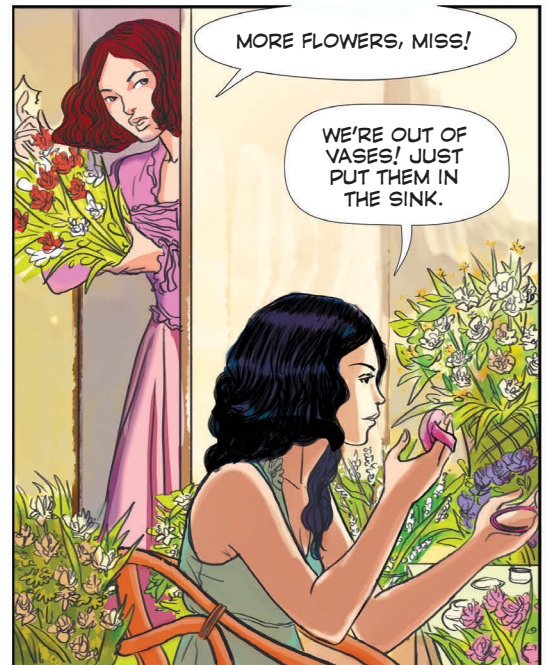
HER DETERMINATION PAID OFF. SHE LANDED A ROLE IN *EKSTASE*, BY GUSTAV MACHATY, A PROVOCATIVE FILM FOR THAT TIME PERIOD. SHE WAS BARELY EIGHTEEN...



SCANDALOUS, HEDY!



DESPITE THE SCANDAL, HEDY KEPT ACTING, ALSO APPEARING ON THE VIENNA STAGE IN *S/SS*.



MORE FLOWERS, MISS!

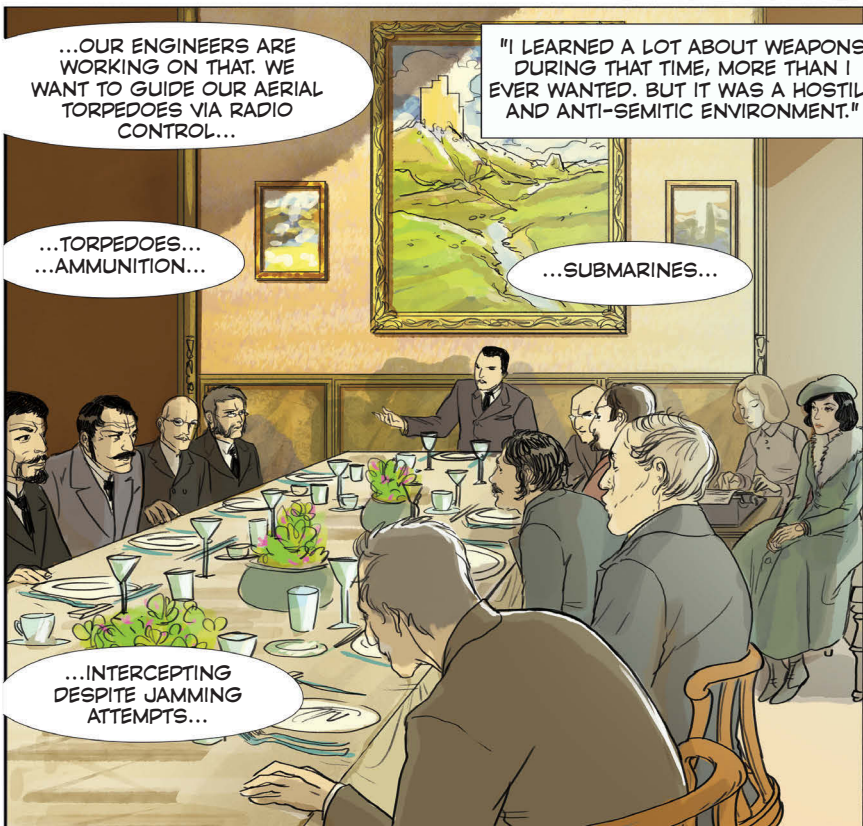
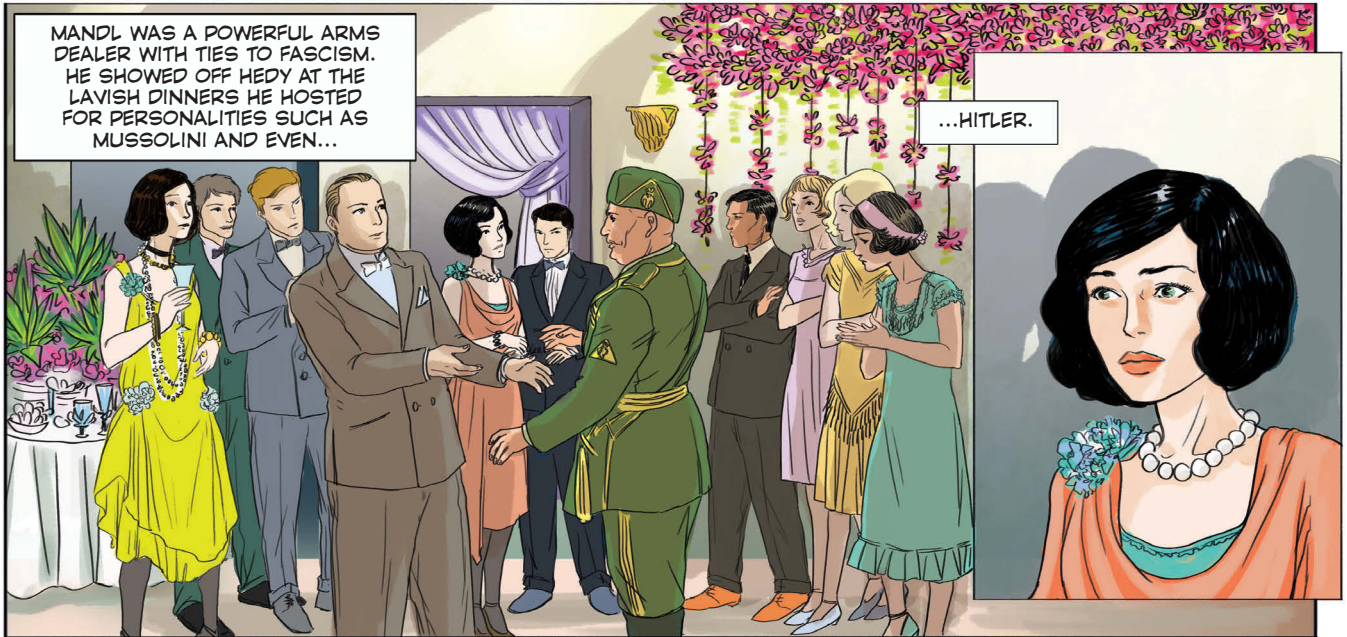
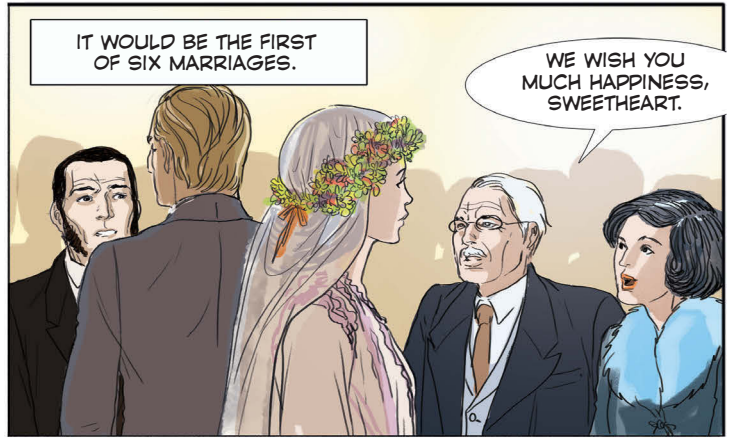
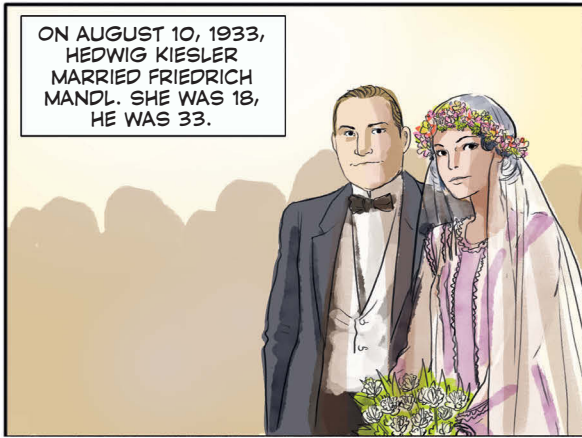
WE'RE OUT OF VASES! JUST PUT THEM IN THE SINK.

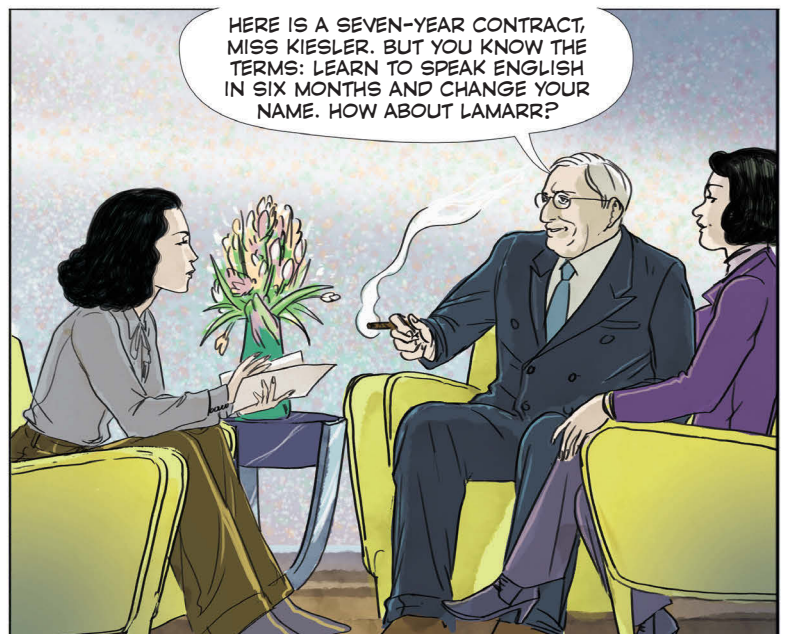
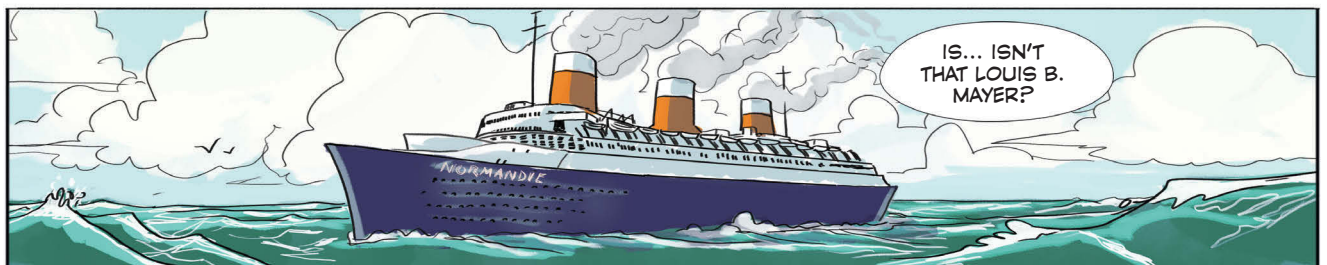
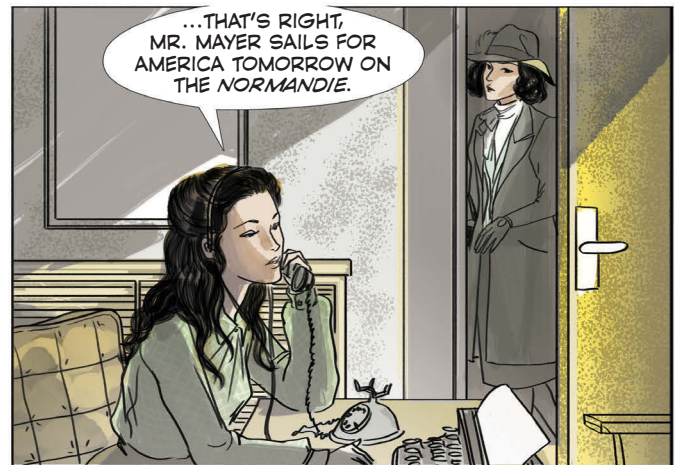
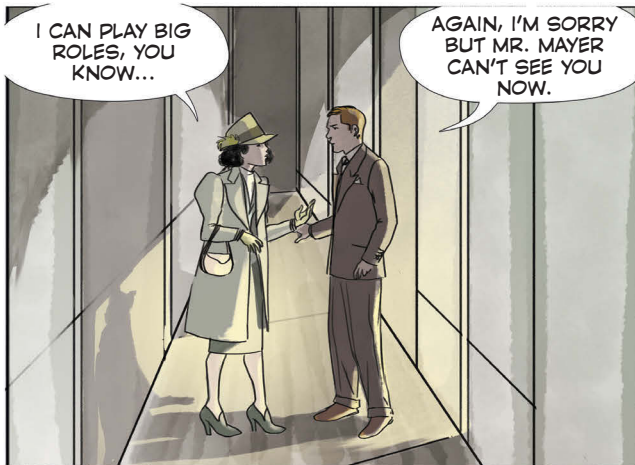
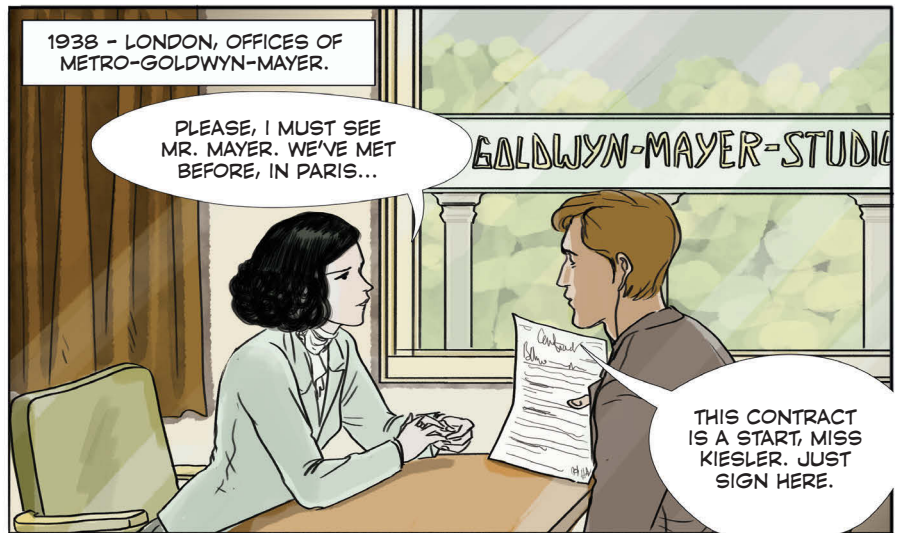


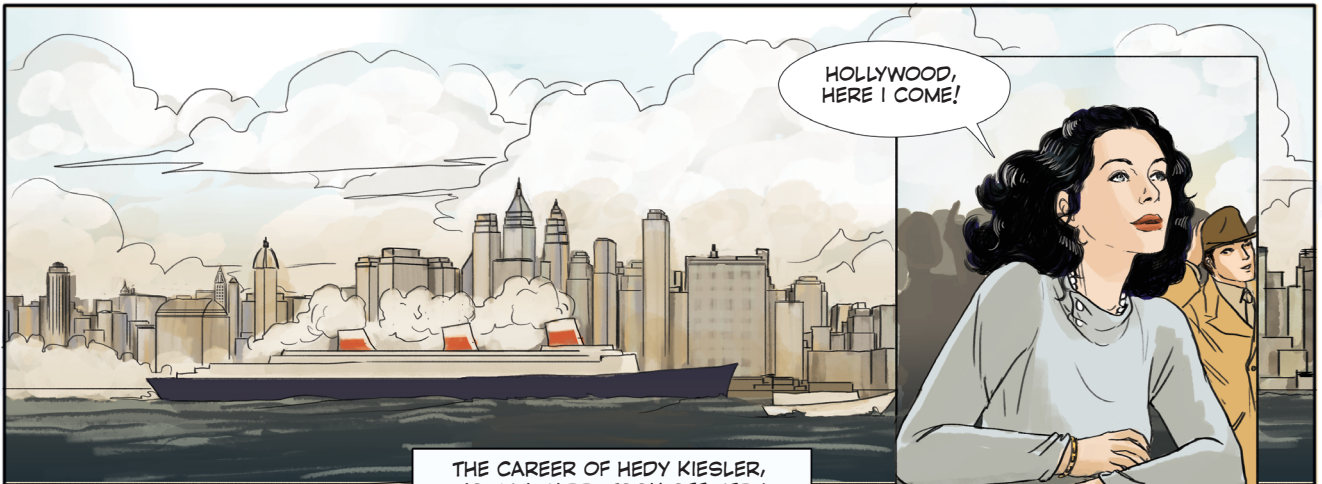
MISS HEDY! OVER HERE!



MISS KIESLER, YOU WERE MARVELOUS! PLEASE DO ME THE HONOR OF DINING WITH ME.



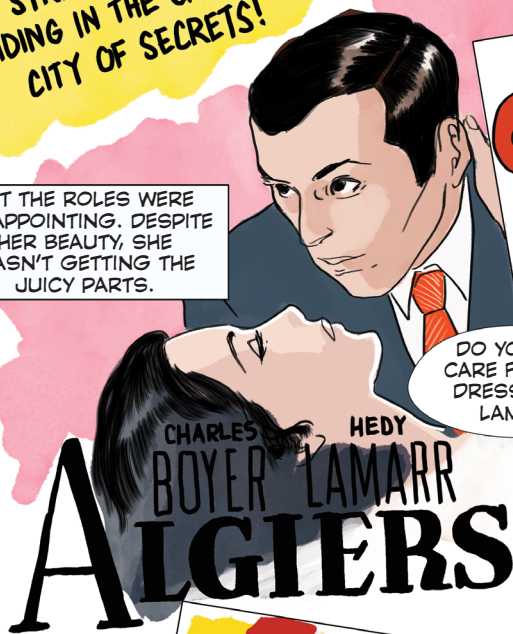




THE CAREER OF HEDY KIESLER, NOW LAMARR, TOOK OFF VERY QUICKLY. FILM AFTER FILM, MAYER REFERRED TO HER AS "THE MOST BEAUTIFUL WOMAN IN THE WORLD."

STRANGE LOVES HIDING IN THE CASBAH CITY OF SECRETS!

YET THE ROLES WERE DISAPPOINTING. DESPITE HER BEAUTY, SHE WASN'T GETTING THE JUICY PARTS.



DO YOU NOT CARE FOR THIS DRESS, MISS LAMARR?

CLARK GABLE • Hedy LAMARR

THE FUNNIEST LOVE COMEDY SINCE "NINOTCHKA"



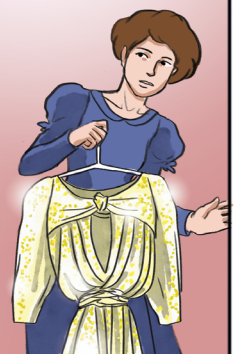
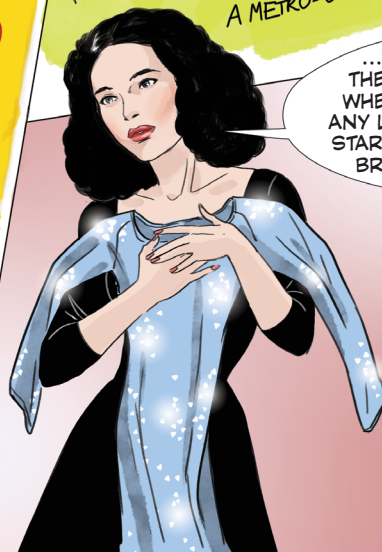
IT'S VERY PRETTY, BUT...

a KING VIDOR

A METRO-GOLDWYN-MAYER PICTURE



...I'VE HAD IT WITH THESE SMALL ROLES WHERE I HARDLY HAVE ANY LINES. AND ALL THE STARLETS HAVE BIGGER BREASTS THAN ME!



IN 1940, HEDY LAMARR MET GEORGE ANTHEIL, A PIANIST AND COMPOSER WHO WROTE THE PIONEERING PIECE FOR PLAYER PIANOS, *BALLET MÉCANIQUE*.

VIEWED AS AN ENFANT TERRIBLE, HE WAS ALSO A JOURNALIST AND INVENTOR IN HIS SPARE TIME.

I HEAR YOU'RE ALSO AN EXPERT IN ENDOCRINOLOGY, MR. ANTHEIL. MY PRODUCERS TELL ME I'M NOT BUSTY ENOUGH.

WHAT WOULD YOU SUGGEST I DO ABOUT THAT?

DEAR HEDY, I'VE LOOKED AT YOUR HORMONE LEVELS SINCE WE TALKED. THEY SHOW THAT YOU'RE IN FULL BLOOM. I DIDN'T NOTICE ANYTHING UNUSUAL. FRANKLY, YOU SHOULDN'T TOUCH YOUR CHEST.

THANK YOU, GEORGE. IF YOU ONLY KNEW...

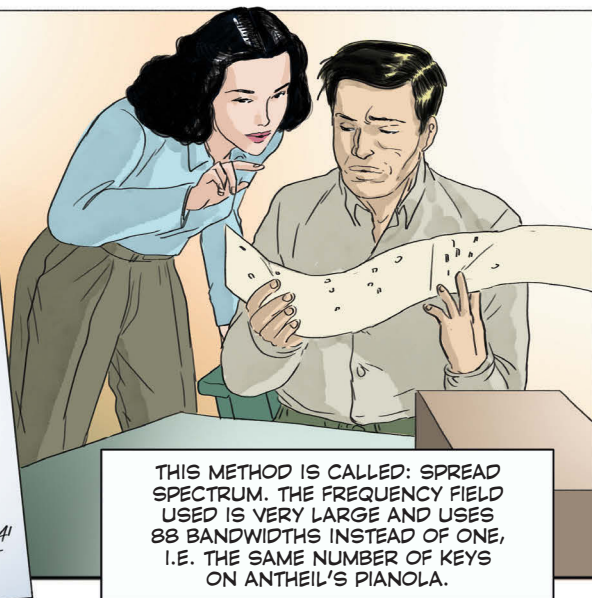
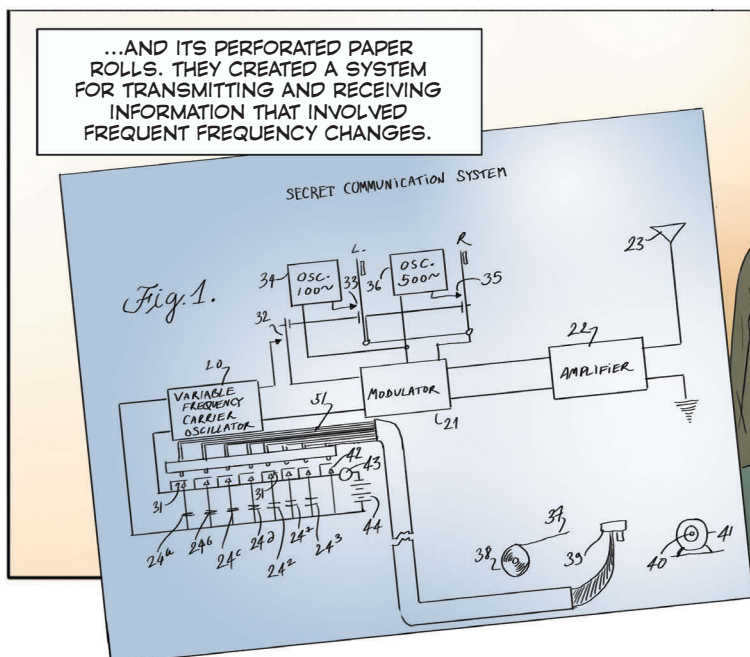
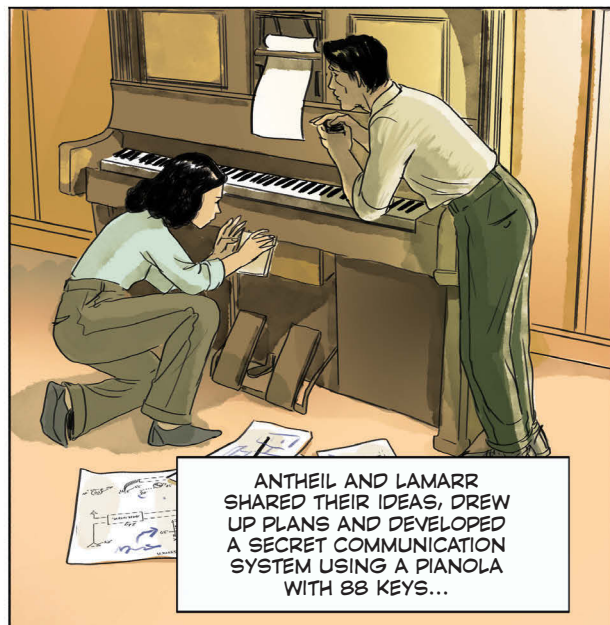
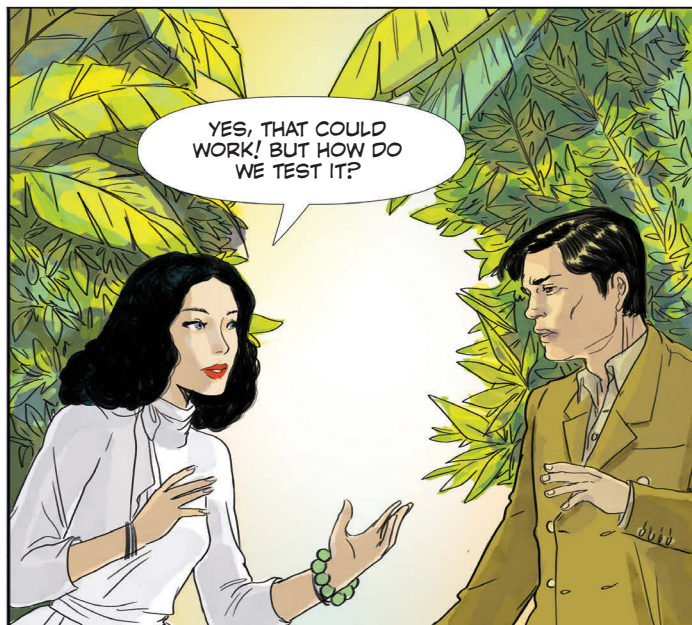
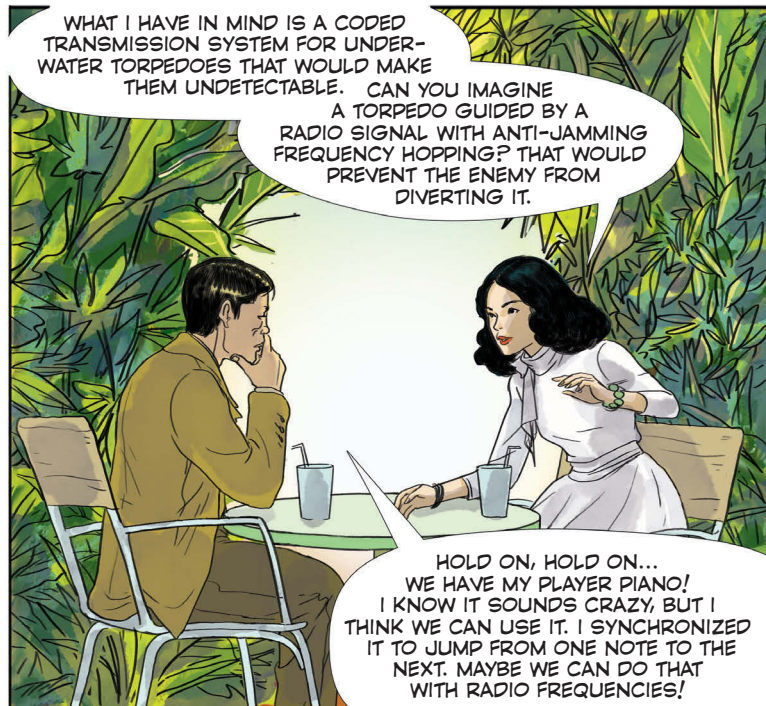
I'M SO BORED HERE. THEY DON'T GIVE ME GOOD SCRIPTS. HOLLYWOOD IS ONLY INTERESTED IN MY FACE! MY BEAUTY IS LIKE A MASK I CAN'T TAKE OFF.

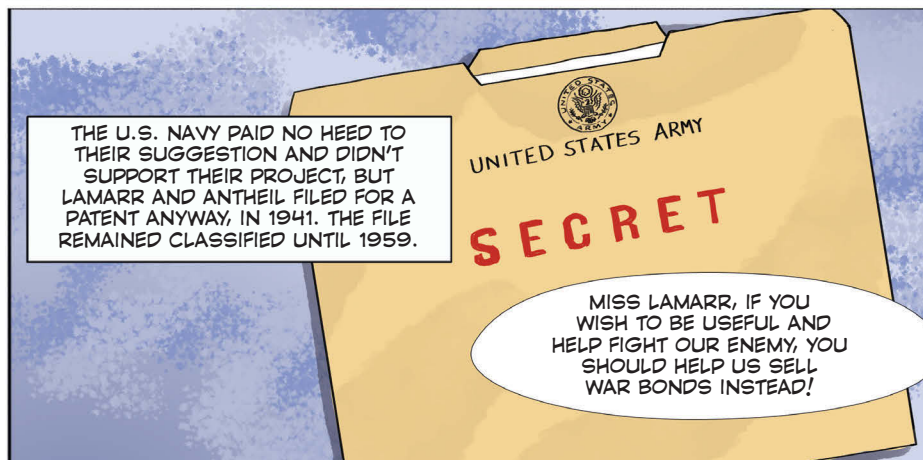
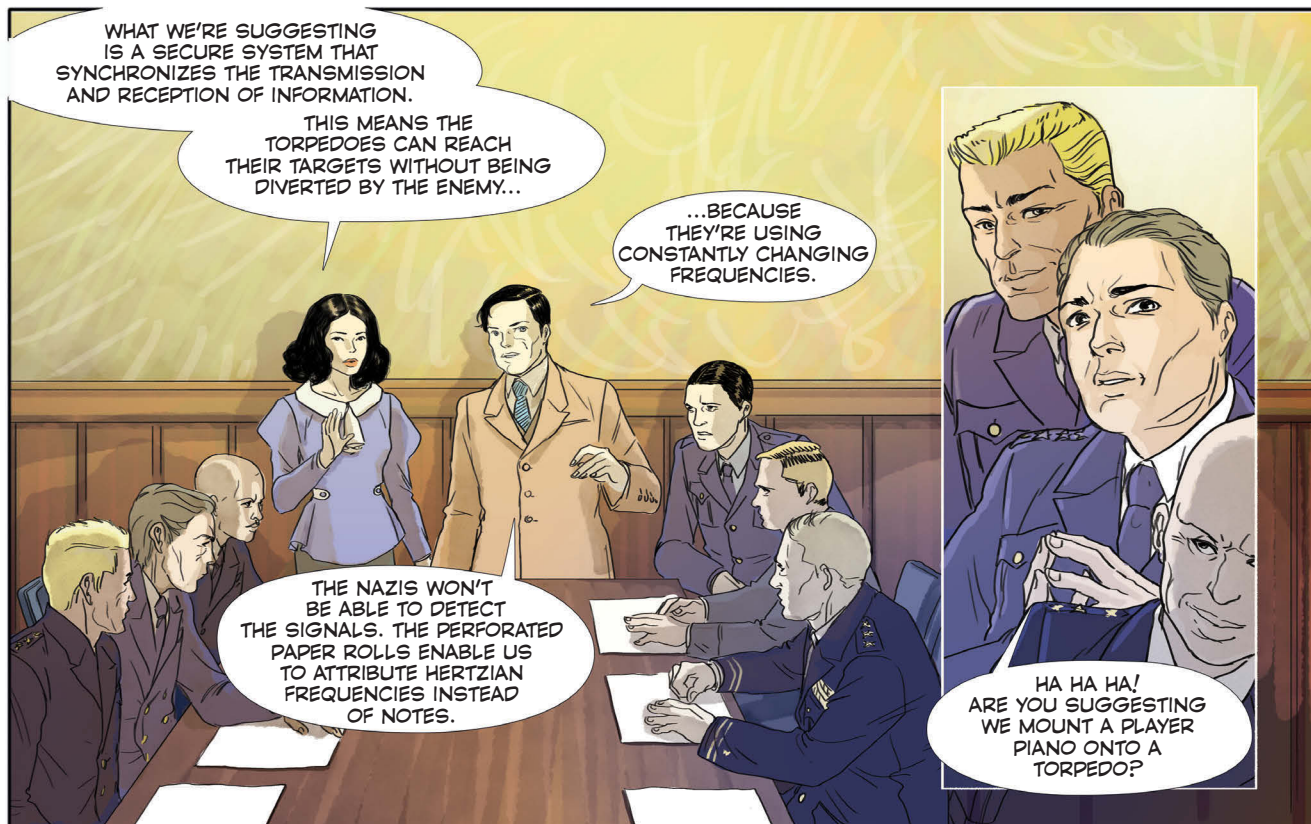
AND I'M SO DISTRESSED BY THIS WAR. YOU KNOW, MY EX-HUSBAND, FRIEDRICH MANDL, IS AN ARMS DEALER. I KNOW A FEW THINGS ABOUT TORPEDOES. WE REALLY NEED TO DO SOMETHING ABOUT THE U-BOATS, THOSE GERMAN SUBS CAUSING SO MUCH DAMAGE TO OUR SHIPS.

YOU'RE UNBELIEVABLE, HEDY. WHO WOULD EVER THINK A WOMAN WOULD WORRY ABOUT SUCH THINGS?

THERE MIGHT BE A WAY TO FIGHT AGAINST STRAY TORPEDOES, POORLY GUIDED TORPEDOES, AMMUNITION, AND NEW WEAPONS...

I HAD AN IDEA, BUT I DON'T KNOW IF IT CAN BE APPLIED!

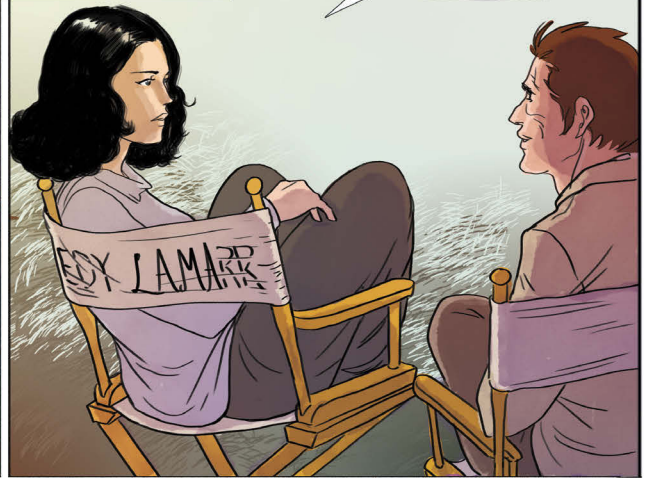
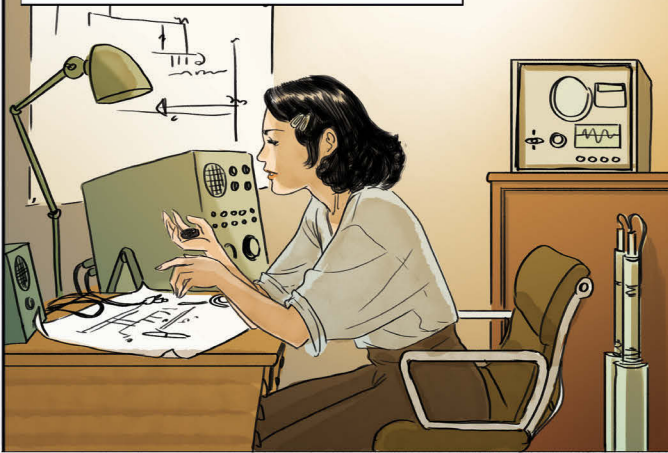




OVER THE FOLLOWING YEARS, HEDY LAMARR KEPT WORKING ON INVENTIONS IN HER WORKSHOP. SHE ALSO APPEARED IN MANY FILMS, WITH VARYING DEGREES OF SUCCESS...

UNFORTUNATELY, THE ROLES WERE MOSTLY SUPERFICIAL AND LINKED PRIMARILY TO HER LOOKS.

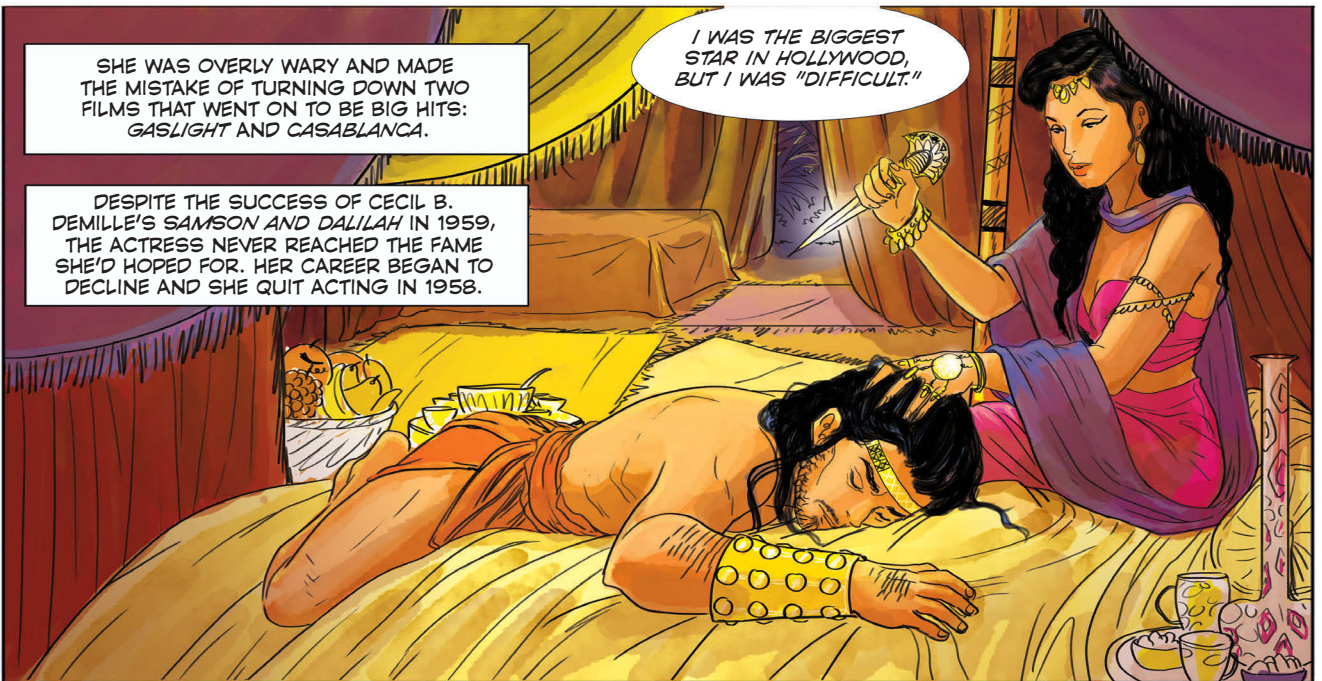
ANYONE CAN BE GLAMOROUS. ALL YOU HAVE TO DO IS STAND STILL AND LOOK STUPID.



SHE WAS OVERLY WARY AND MADE THE MISTAKE OF TURNING DOWN TWO FILMS THAT WENT ON TO BE BIG HITS: *GASLIGHT* AND *CASABLANCA*.

DESPITE THE SUCCESS OF CECIL B. DEMILLE'S *SAMSON AND DALILAH* IN 1959, THE ACTRESS NEVER REACHED THE FAME SHE'D HOPED FOR. HER CAREER BEGAN TO DECLINE AND SHE QUIT ACTING IN 1958.

I WAS THE BIGGEST STAR IN HOLLYWOOD, BUT I WAS "DIFFICULT."



"THE LADDER OF SUCCESS IN HOLLYWOOD IS USUALLY A PRESS AGENT, ACTOR, DIRECTOR, PRODUCER, LEADING MAN; AND YOU ARE A STAR IF YOU SLEEP WITH EACH OF THEM IN THAT ORDER. CRUDE, BUT TRUE."



IN ADDITION TO COUNTLESS LOVE AFFAIRS, HEDY LAMARR WAS MARRIED SIX TIMES. IN 1933 TO FRITZ MANDL...

TO WRITER AND PRODUCER GENE MARKEY IN 1939...

TO THE ACTOR JOHN LODER, IN 1943, WITH WHOM SHE HAD TWO CHILDREN: ANTHONY AND DENISE.

TO MUSICIAN TEDDY STAUFFER IN 1951.

TO TEXAS OILMAN WILLIAM HOWARD LEE IN 1953.

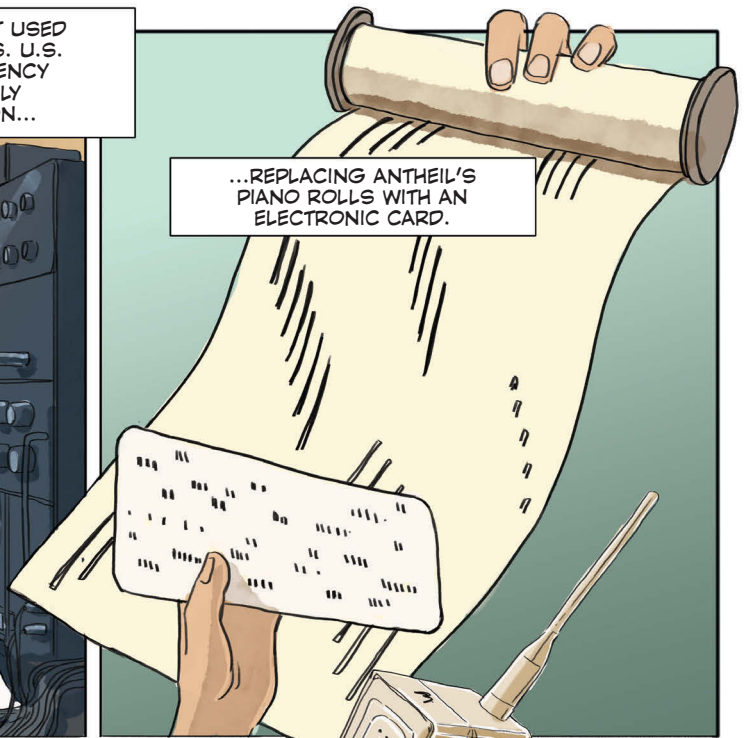
AND TO LEWIS J. BOIES, AN ATTORNEY, IN 1963...

PERHAPS MY PROBLEM WITH MARRIAGE, AND IT'S A PROBLEM FOR MANY WOMEN... WAS TO WANT BOTH INTIMACY AND INDEPENDENCE AT ONCE.

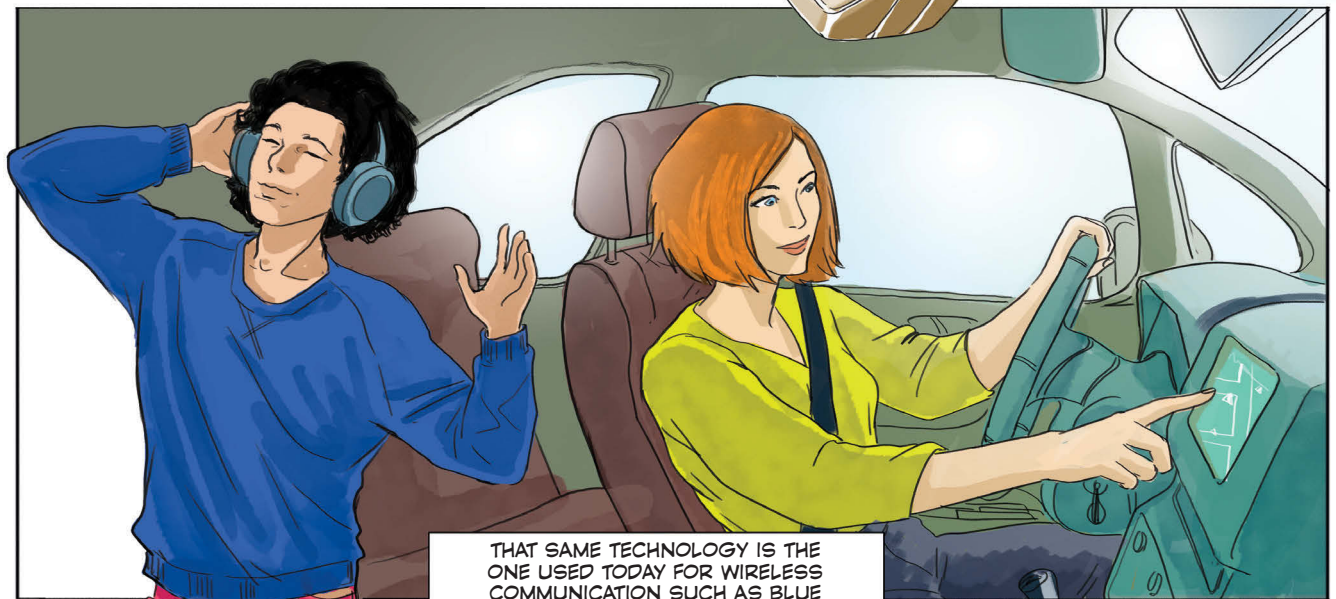
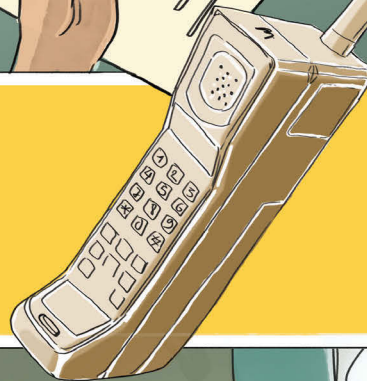
THE INVENTION OF LAMARR AND ANTHEIL WASN'T USED UNTIL 1962, DURING THE CUBAN MISSILE CRISIS. U.S. NAVY ENGINEERS "REDISCOVERED" THE FREQUENCY HOPPING GUIDANCE SYSTEM AND GRADUALLY STARTED USING IT FOR RADIO COMMUNICATION...



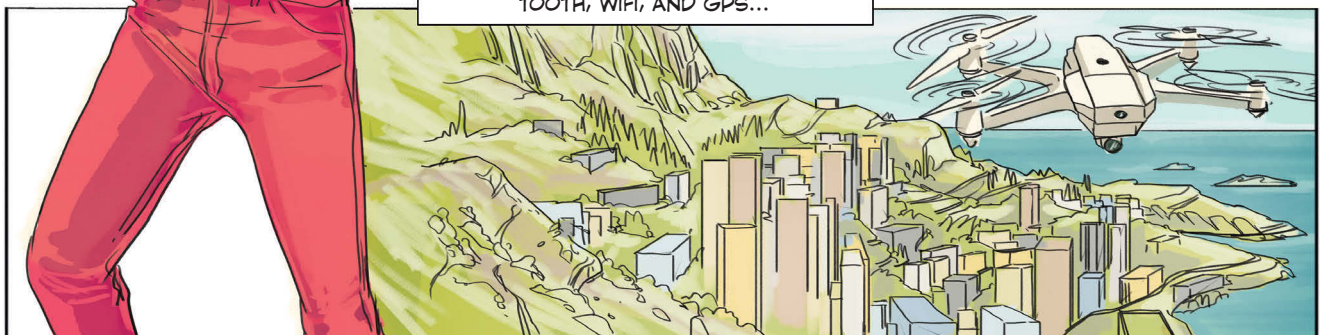
...REPLACING ANTHEIL'S PIANO ROLLS WITH AN ELECTRONIC CARD.



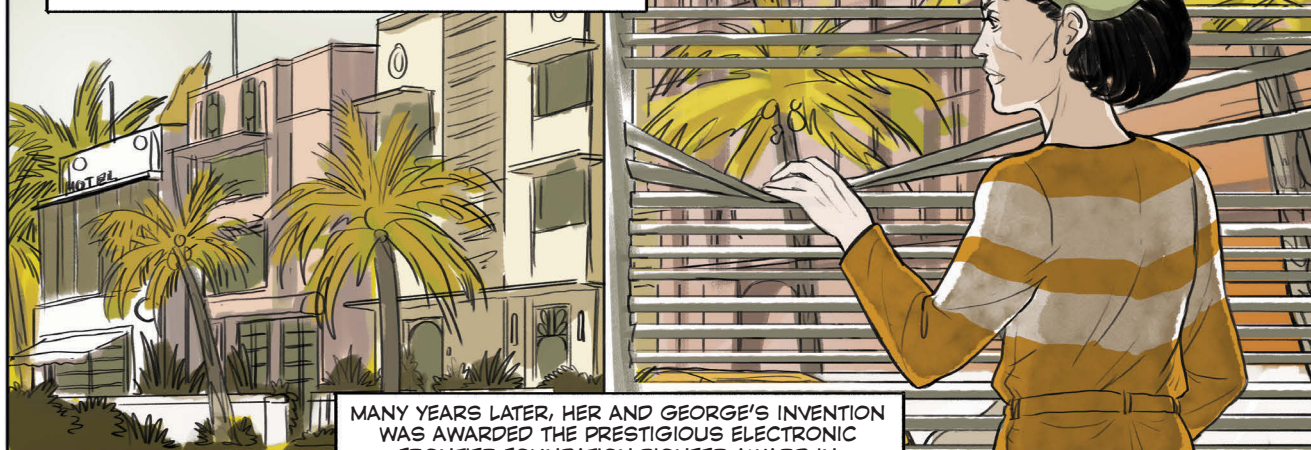
DURING THE 70S, LAB TEAMS AT MOTOROLA DEVELOPED THE VERY FIRST CELL PHONES, WHICH WOULD HAVE BEEN INCONCEIVABLE WITHOUT SPREAD-SPECTRUM TECHNIQUES.



THAT SAME TECHNOLOGY IS THE ONE USED TODAY FOR WIRELESS COMMUNICATION SUCH AS BLUE TOOTH, WIFI, AND GPS...

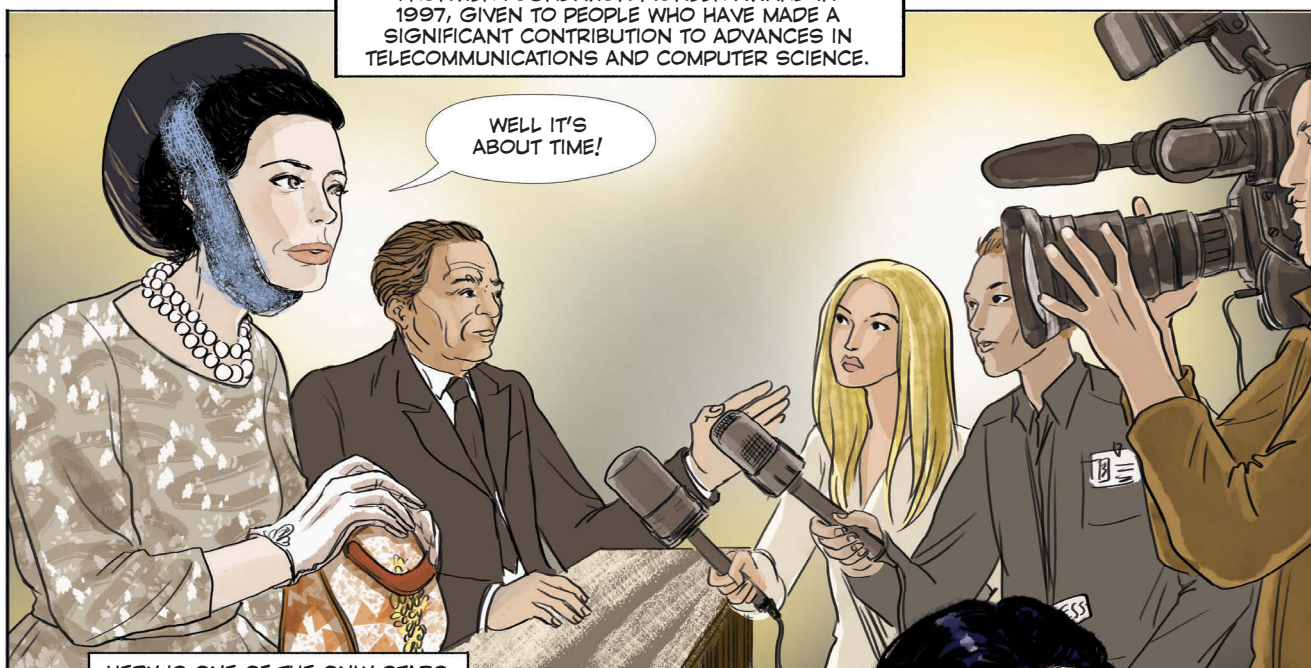


FLORIDA, 1977. HEDY LAMARR NOW AVOIDED ALL SOCIAL INTERACTION. A PRISONER OF HER LOOKS, SHE UNDERWENT PLASTIC SURGERY OPERATIONS AND NO LONGER APPEARED IN PUBLIC. SHE ONLY SPOKE TO PEOPLE ON THE PHONE, INCLUDING HER OWN CHILDREN.



MANY YEARS LATER, HER AND GEORGE'S INVENTION WAS AWARDED THE PRESTIGIOUS ELECTRONIC FRONTIER FOUNDATION PIONEER AWARD IN 1997, GIVEN TO PEOPLE WHO HAVE MADE A SIGNIFICANT CONTRIBUTION TO ADVANCES IN TELECOMMUNICATIONS AND COMPUTER SCIENCE.

WELL IT'S ABOUT TIME!



HEDY IS ONE OF THE ONLY STARS ON THE HOLLYWOOD WALK OF FAME TO BE CREDITED NOT JUST FOR HER CAREER AS AN ACTRESS, BUT FOR HER INVENTION AS WELL.

SHE DIED ALONE IN 2000, IN HER HOUSE IN FLORIDA.





Katherine Coleman Goble Johnson

1918 - 2020

American mathematician and astrophysicist

Born in 1918 in West Virginia, to a farmer father and a schoolteacher mother, **Katherine Coleman** demonstrated an inclination for studies at an early age.

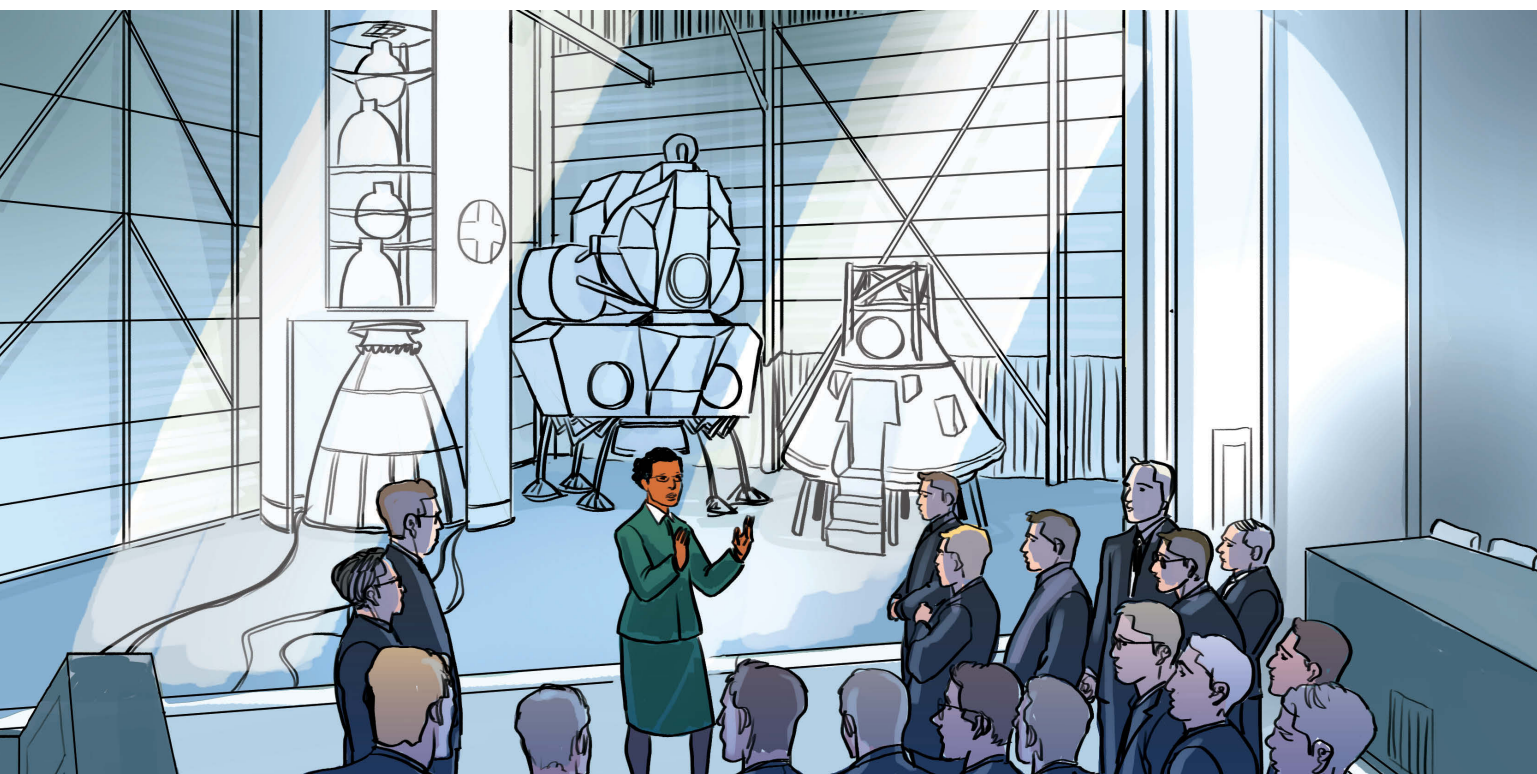
As the education system in her county did not offer classes to African-American students past the 8th grade, young Katherine had to attend high school at West Virginia State College in the town of Institute, from which she graduated at the age of fourteen.

Her gift for mathematics landed her a teaching job shortly after graduation, but she quit to attend graduate school, hoping to embark on a career as a research mathematician. In 1952, she responded to

an announcement put out by NACA (later NASA), which was seeking to integrate African-American women.

There, she became one of the brains of the mathematical calculations department, enduring racism and sexism while asserting herself as the only female member of a team working on flights, trajectories and aerodynamics.

Among many prestigious assignments, she calculated the trajectory of the Apollo 11 mission to the Moon. In 2015, the little Black girl who became a NASA engineer was awarded the Presidential Medal of Freedom, the highest civilian decoration in the United States.



Marthe Gautier

1925 -

French pediatrician and researcher



Born in 1925 into a family of farmers, **Marthe Gautier** decided early on to study medicine, following in the footsteps of her sister, a pediatrician who died at a young age during WWII fighting.

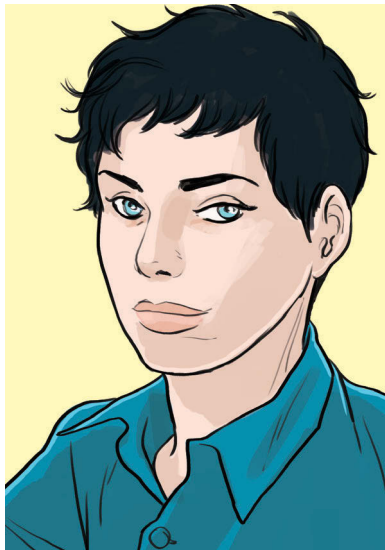
Initially a heart disease researcher, she excelled in cell culture, which she developed at the Trousseau hospital in Paris with very few resources, a lot of inventiveness, and her own personal techniques.

She soon discovered that the cells of normal children had 46 chromosomes, whereas the tissues of children with Down Syndrome had one extra chromosome. One of her colleagues, Jérôme Lejeune, a researcher in the same department at the CNRS, France's leading research Institute, then took an interest in her work and allowed her to

work in better conditions, with more effective and recent equipment. Unfortunately, he took it upon himself to announce the discovery to the scientific world during a genetics seminar in Montreal, unfairly leaving Marthe Gautier in the shadows.

Not until 2014 did the ethics committee of INSERM (the French National Institute of Health and Medical Research) declare: "The discovery of Down Syndrome could not have been made without the essential contributions of Raymond Turpin and Marthe Gautier; it is regrettable that both their names were not automatically associated with this discovery, both in the announcement and in the attribution of various honors."





Maryam Mirzakhani

1977 – 2017

Iranian mathematician

Fields Medal 2014

Born in 1977 in Iran, **Maryam Mirzakhani** earned a Bachelors degree in mathematics in Tehran, in an academic system that was increasingly open to women, and then moved to the U.S., where she earned a doctorate in mathematics at Harvard in 2004.

She became the first and only woman to win the Fields Medal, known as the Nobel Prize in Mathematics and awarded every four years, for her work in geometry and the calculation of hyperbolic surfaces—such as the surface of a donut, for example.

Maryam had a very particular way of approaching and teaching mathematics, which she viewed a bit like an artistic subject. Where

most people saw formulas and symbols, she would see scenes; she liked to make doodles of natural elements such as flowers, and she enjoyed solving puzzles with an ease, optimism and joy that she passed on to her students and colleagues, allowing them to push past their own limits.

Sadly, she died prematurely of breast cancer at the age of 40, leaving the world of mathematics in mourning.

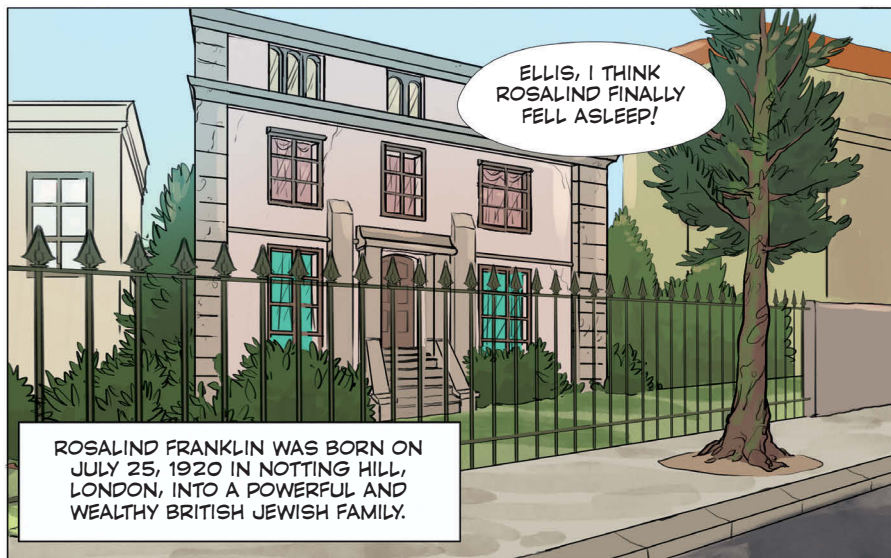


ROSALIND FRANKLIN

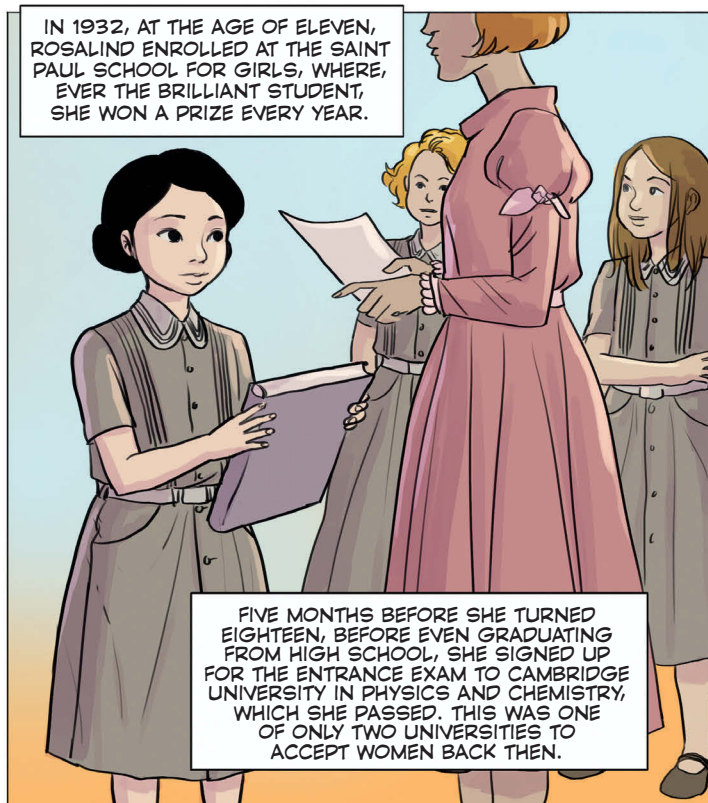
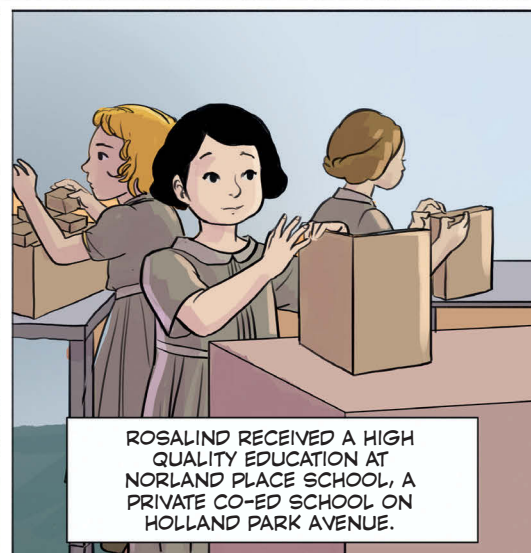
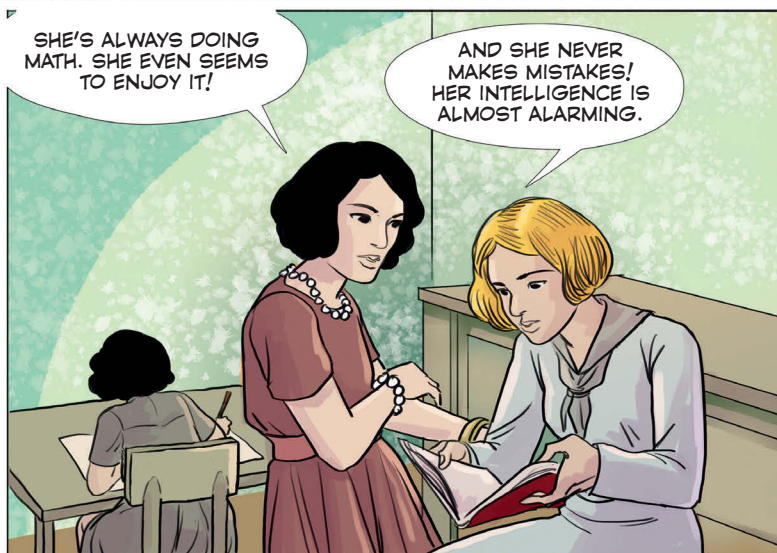
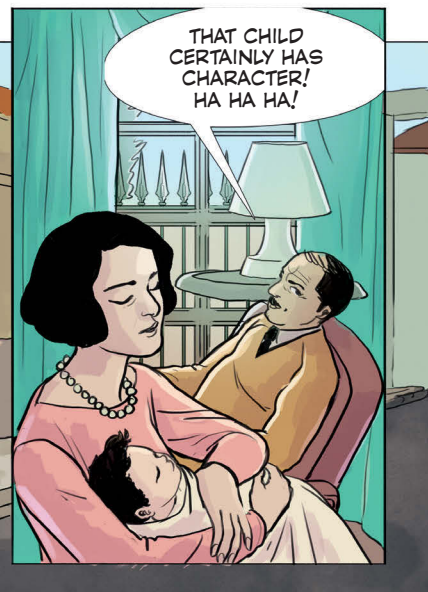


1920 -1958

English pioneer in the field of molecular biology and DNA research.
Awarded the Louisa Gross Horwitz prize posthumously in 2008.



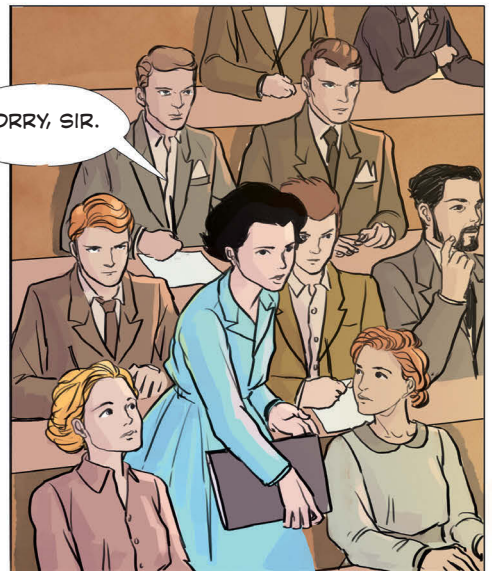
ROSALIND FRANKLIN WAS BORN ON JULY 25, 1920 IN NOTTING HILL, LONDON, INTO A POWERFUL AND WEALTHY BRITISH JEWISH FAMILY.





1938 -
NEWNHAM COLLEGE.

YOU'RE
LATE, MISS
FRANKLIN!



SORRY, SIR.



ROSALIND OFTEN WORKED
ALONE IN THE LAB. SHE
MISSED HER OLD FRIENDS
FROM SAINT PAUL.



WHAT IS A
CRYSTAL?



THE WAR STARTED TO INFLUENCE
ROSALIND'S STUDIES. BUT SHE DIDN'T
ALWAYS OBEY ALL THE RULES.

ROSALIND,
IT'S AN AIR RAID,
WE HAVE TO GO!

COMING!

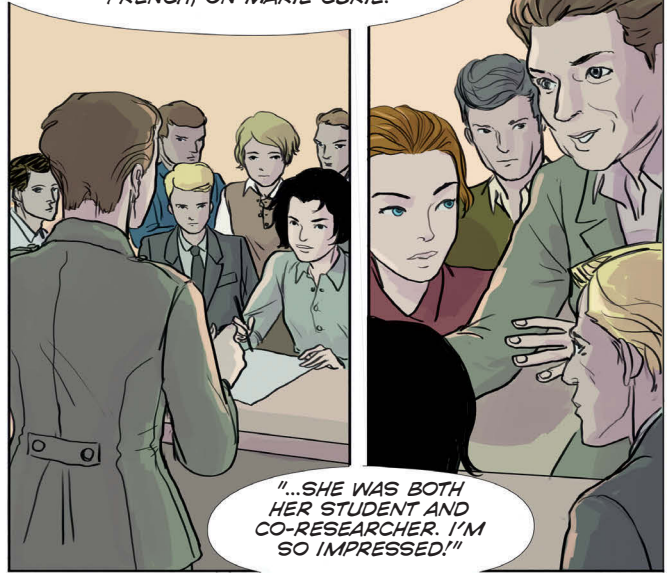


1940: THE THIRD YEAR WAS THE ONE EMPHASIZING PHYSICS AND CHEMISTRY, BUT FOR ROSALIND, IT WAS THE YEAR OF THE LONDON BLITZ.



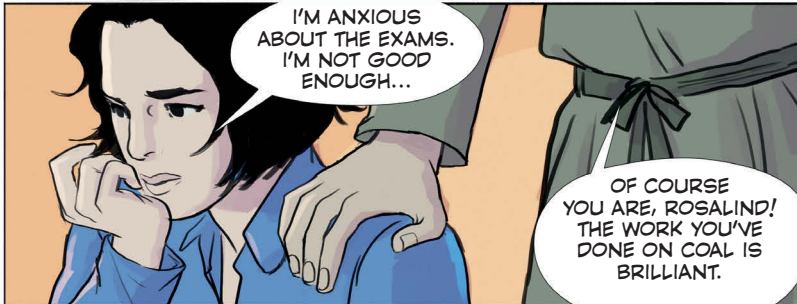
"DEAR PARENTS, VIRTUALLY THE ENTIRE LAB IS GONE. BIOCHEMISTRY IS NOW HANDLED BY PROFESSORS OF GERMAN ANCESTRY THAT CAN'T JOIN THE ARMY..."

"...CAMBRIDGE IS TAKING IN WAR REFUGEES. I HAD THE GOOD FORTUNE OF MEETING ADRIENNE WEILL, A FRENCH SCIENTIST, WHO GAVE A FASCINATING LECTURE, IN FRENCH, ON MARIE CURIE.



"...SHE WAS BOTH HER STUDENT AND CO-RESEARCHER. I'M SO IMPRESSED!"

I'M ANXIOUS ABOUT THE EXAMS. I'M NOT GOOD ENOUGH...



OF COURSE YOU ARE, ROSALIND! THE WORK YOU'VE DONE ON COAL IS BRILLIANT.

"DEAR PARENTS, I RECEIVED A FELLOWSHIP GRANT AND AM GOING TO STAY ONE MORE YEAR, WORKING UNDER PROFESSOR DANTON. I AM NOW ONE OF THE VOLUNTEER FIREFIGHTERS AT CAMBRIDGE. SINCE SO MANY MEN ARE IN THE WAR, WE WOMEN HAVE TO TAKE THEIR PLACE... EVEN THOUGH PEOPLE DON'T SEEM TO APPRECIATE IT MUCH..."

DEAR PARENTS,

IN THE END, I DID GET MY DIPLOMA, CUM LAUDE.

I COULD HAVE DONE BETTER BUT I HAVEN'T BEEN SLEEPING WELL, AND I HAVE A COLD THAT PREVENTED ME FROM PERFORMING AT MY HIGHEST LEVEL.

I CAN'T WAIT TO SEE YOU FOR THE HOLIDAYS.

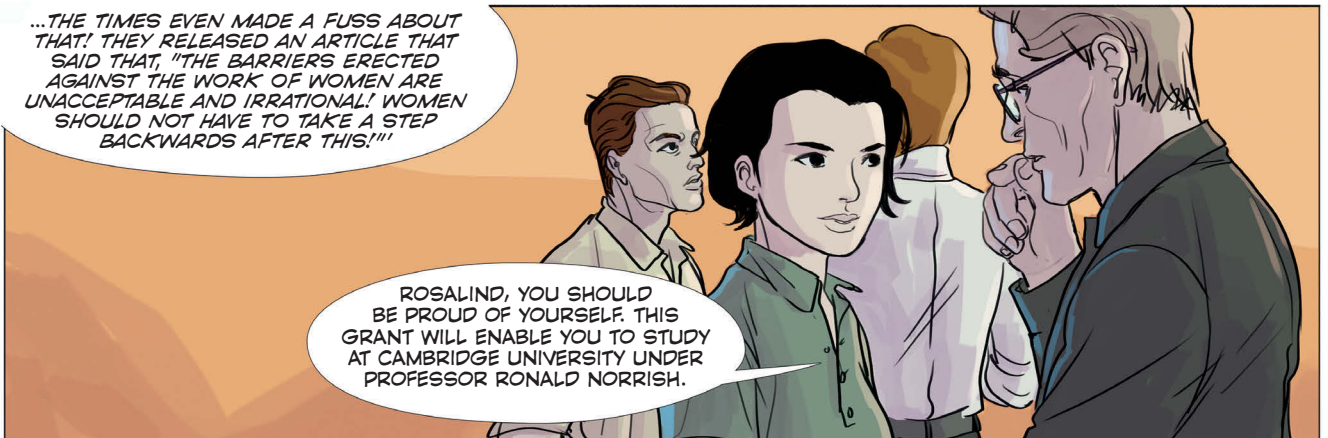
MUCH LOVE,

ROSALIND



"...THE TIMES EVEN MADE A FUSS ABOUT THAT! THEY RELEASED AN ARTICLE THAT SAID THAT, 'THE BARRIERS ERECTED AGAINST THE WORK OF WOMEN ARE UNACCEPTABLE AND IRRATIONAL! WOMEN SHOULD NOT HAVE TO TAKE A STEP BACKWARDS AFTER THIS!'"

ROSALIND, YOU SHOULD BE PROUD OF YOURSELF. THIS GRANT WILL ENABLE YOU TO STUDY AT CAMBRIDGE UNIVERSITY UNDER PROFESSOR RONALD NORRISH.



PROFESSOR NORRISH IS MAKING ME WORK ON THE POLYMERIZATION OF THE FORMIC ACID OF ACETALDEHYDE. YOU TOLD ME THIS WORK WOULD BE TRIVIAL AND YOU WERE RIGHT.

I'M DISAPPOINTED... AND MY OFFICE IS SO DARK...

TRY TO UNDERSTAND HIM. THE WAR SEPARATED HIM FROM HIS WIFE AND HIS TWO DAUGHTERS. IT'S VERY HARD ON HIM.

HE DOESN'T LIKE THAT I'M HERE. HE NEVER ENCOURAGES ME.

ULTIMATELY, IN 1942, AFTER A YEAR OF DISAPPOINTMENT AND TENSION, ROSALIND ABANDONED HER RESEARCH.

SHE JOINED THE BRITISH ASSOCIATION FOR RESEARCH ON THE USE OF COAL.

THIS JOB AS AN ASSOCIATE RESEARCHER WILL BE MY CONTRIBUTION TO THE WAR EFFORT!

SO IN ORDER TO STUDY THE DENSITY OF COAL, I COMPARED IT TO THE DENSITY OF HELIUM..

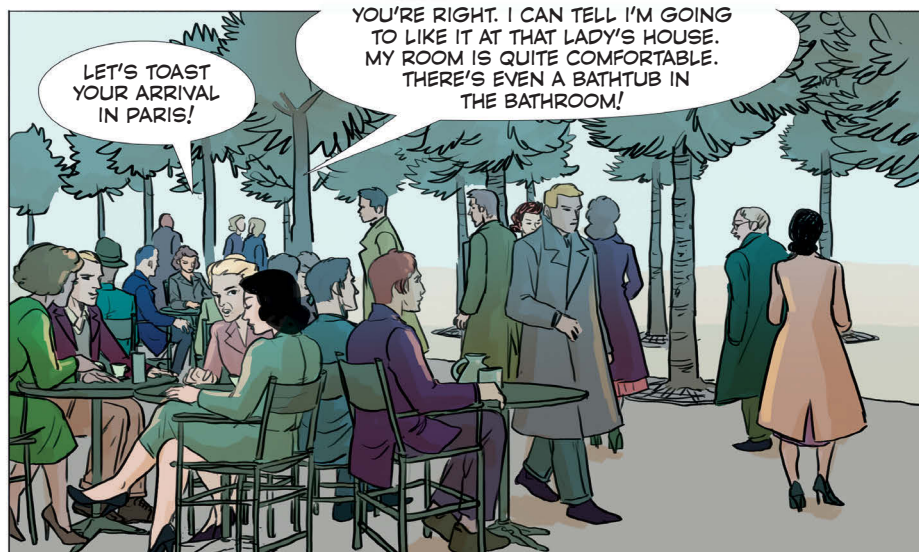
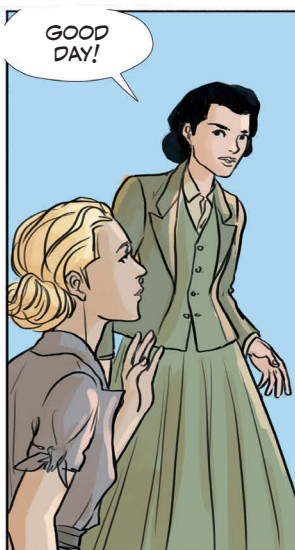
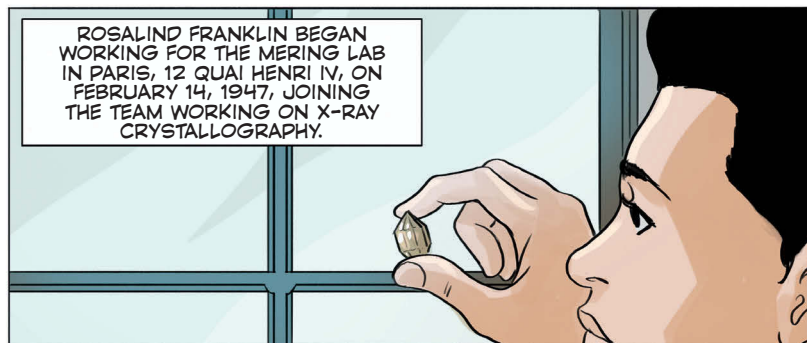
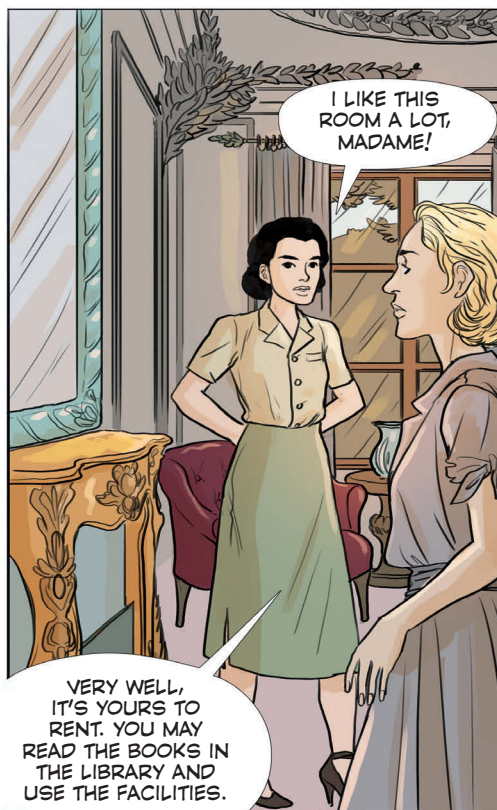
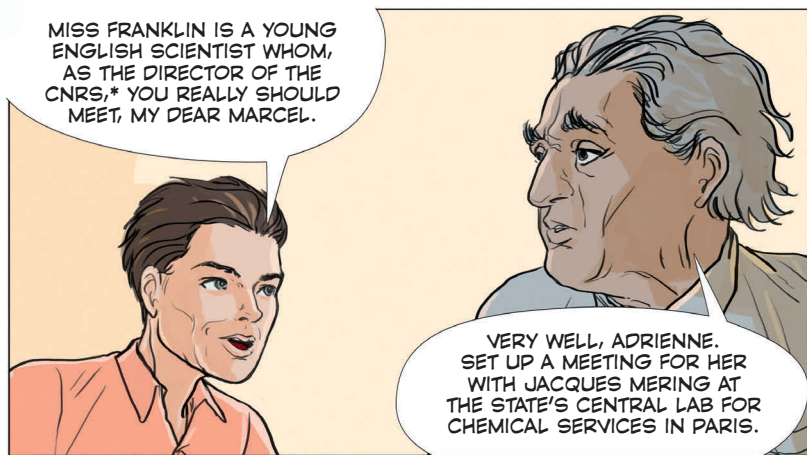
...AND GRADUALLY, AS I RAISED THE TEMPERATURE, THE SUBSTANCES WERE EXPELLED IN THE ORDER OF THEIR MOLECULAR SIZE.

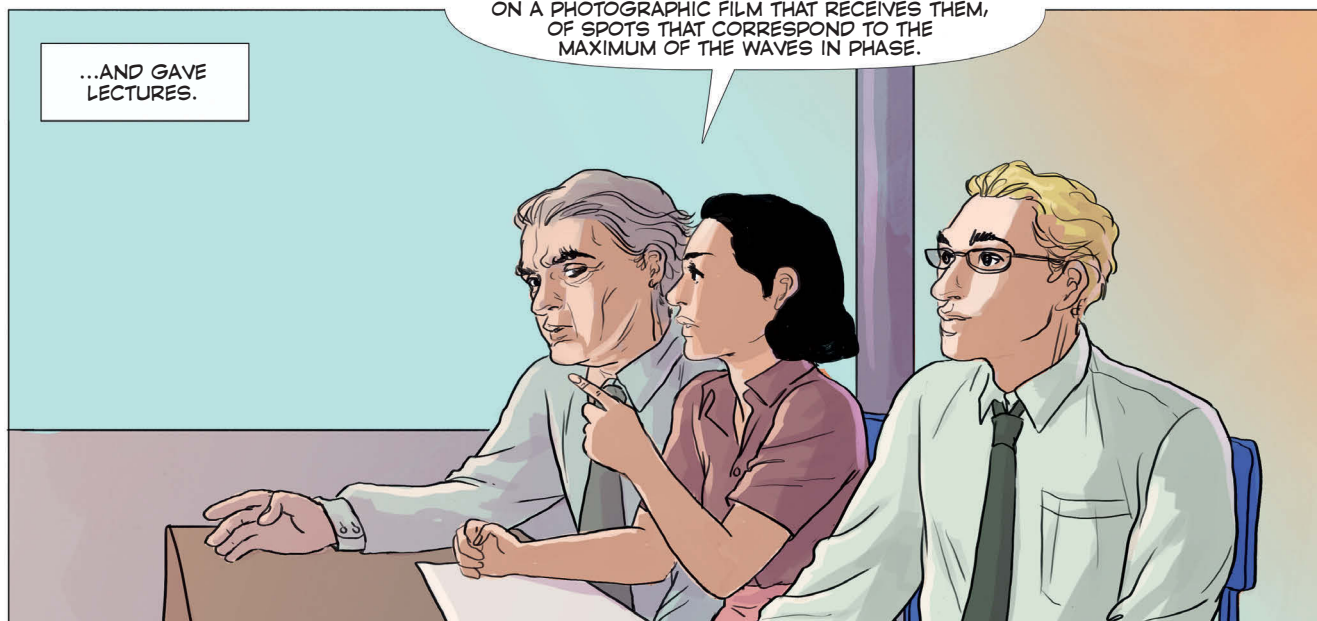
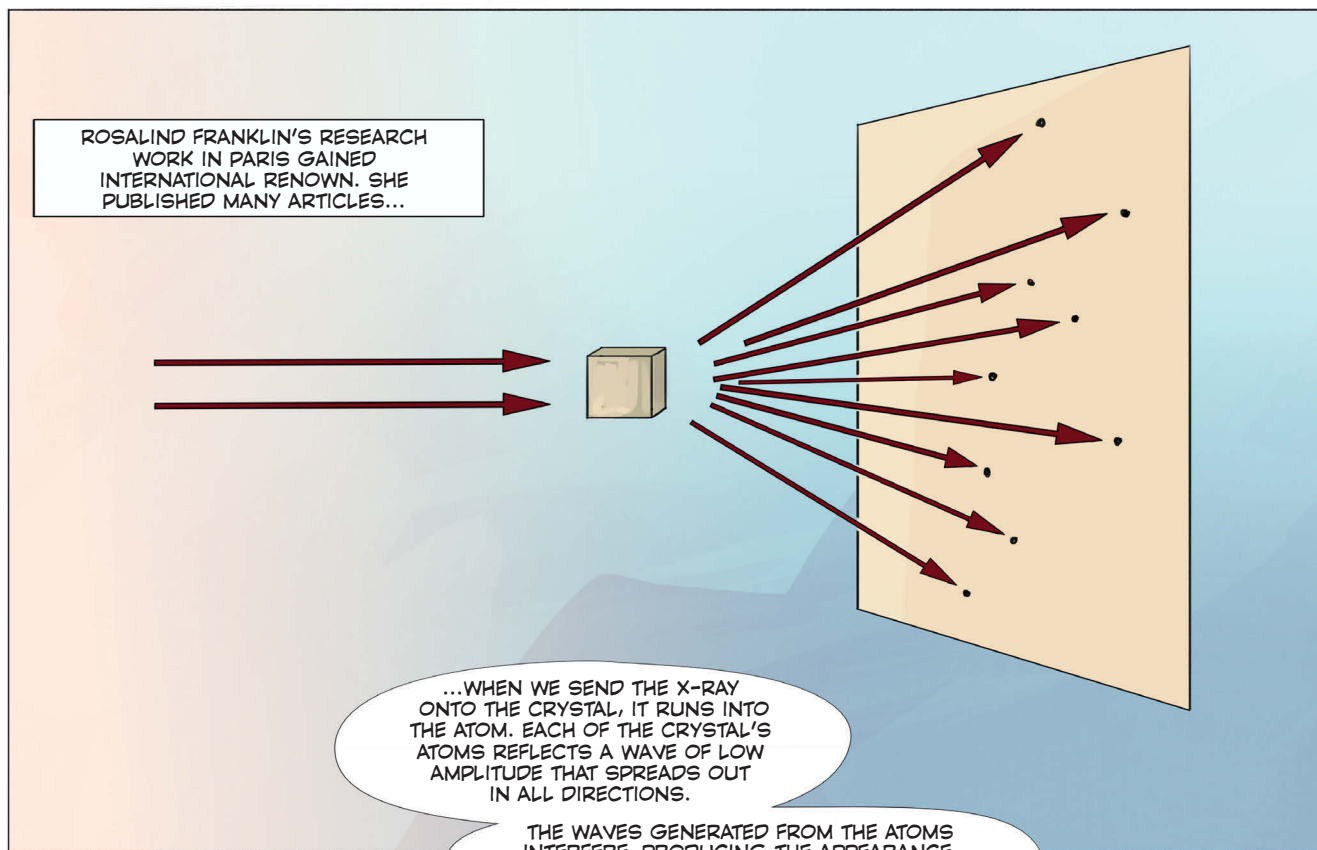
WE CAN CONTRIBUTE TO THE CLASSIFICATION OF COALS NOW THAT WE KNOW HOW THEY BEHAVE. I THINK WE CAN IMPROVE THE ONES THEY PUT IN THE GAS MASKS.

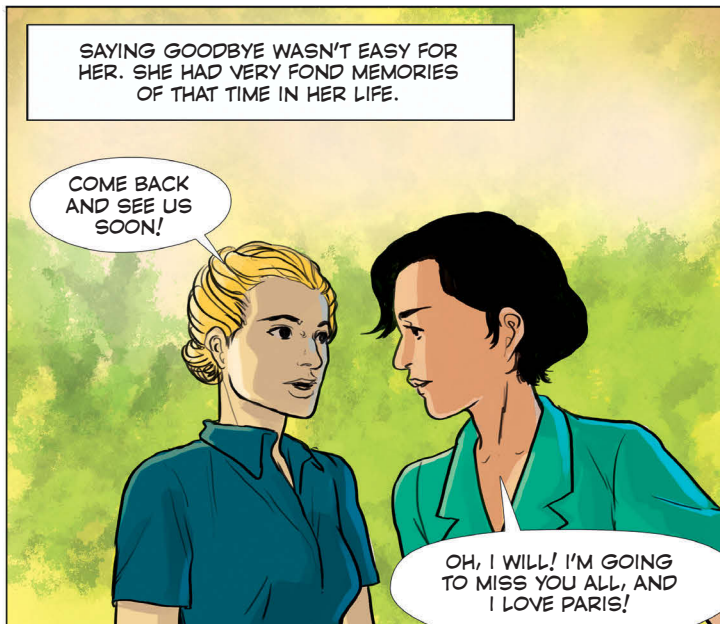
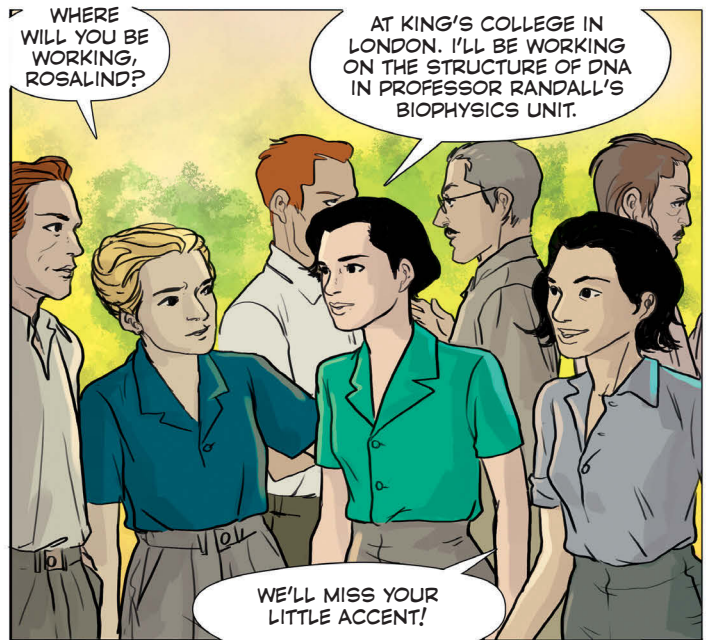
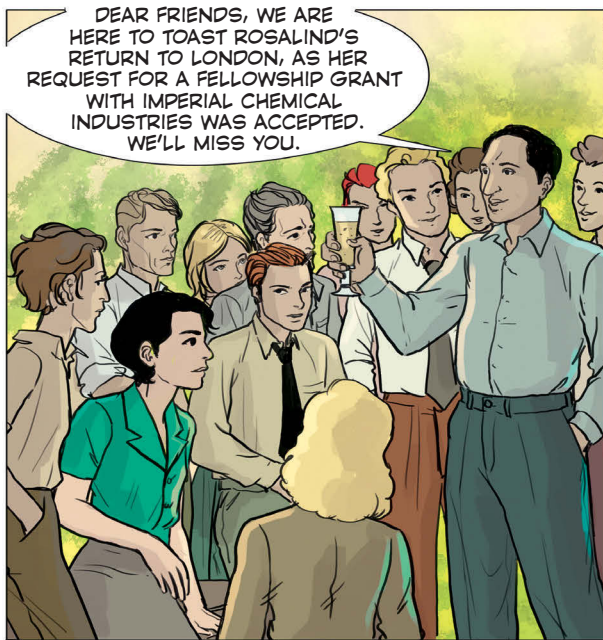
SHE EARNED HER DOCTORATE IN PHYSICAL CHEMISTRY FROM CAMBRIDGE IN 1945.

"DEAR ADRIENNE, I'M WORKING AND FINISHING UP MY THESIS, AND LOOKING FOR A JOB IN PHYSICAL CHEMISTRY, HAVING LITTLE KNOWLEDGE OF PHYSICAL CHEMISTRY BUT EXTENSIVE KNOWLEDGE OF THE MICROSTRUCTURES OF COAL."

SHE LOVED TO TRAVEL AND TOOK A VACATION.







BUT THE ATMOSPHERE AT KING'S COLLEGE WAS QUITE DIFFERENT THAN THE ONE IN PARIS. ROSALIND FRANKLIN WAS ISOLATED AND ONLY WORKED WITH HER STUDENT, RAYMOND GOSLING.

PROFESSOR WILKINS DOESN'T SEEM TO BE A BIG FAN OF YOURS, MA'AM.

THE FRENCH SCIENTISTS IN PARIS ARE MUCH MORE OPEN TO WORKING WITH WOMEN, RAYMOND, TRUST ME!

MR. WILKINS MUST HAVE THOUGHT I WOULD BE HIS ASSISTANT. OUT OF THE QUESTION. I'LL CONDUCT MY OWN RESEARCH!

BUT WILKINS IS ALSO WORKING ON THE DNA MOLECULE. WHY NOT COMBINE YOUR RESEARCH?

WE CAN'T LET THIS AFFECT OUR RESEARCH, RAYMOND. WE HAVE WORK TO DO. SETTING UP THIS MACHINE THAT CAN TAKE X-RAY PHOTOS WAS A REAL CHALLENGE, SO LET'S MAKE THE MOST OF IT AND TAKE THE BEST POSSIBLE IMAGES OF OUR DNA SAMPLES!

THAT'S A QUESTION YOU SHOULD ASK HIM. I WAS TOLD I WASN'T QUALIFIED TO INTERPRET MY IMAGES, WHEREAS I'M A CRYSTALLOGRAPHER AND HE IS NOT.

AND DON'T WORRY. YOU WILL CO-AUTHOR ALL THE ARTICLES THAT DERIVE FROM OUR RESEARCH.

MAY 1952.

LOOK, WE CAN SEE AN X-SHAPED FORM, WHICH INDICATES A HELIX STRUCTURE...

GOOD. WE NEED TO NUMBER OUR PHOTOS.

...SO THIS ONE IS PHOTO NO. 51...

I'D LIKE TO TAKE MORE PHOTOS SO WE CAN GET A BETTER OVERALL IMAGE OF THE STRUCTURE BEFORE WE PUBLISH ANYTHING.

AT THE SAME TIME, CRICK AND WATSON, RESEARCH SCIENTISTS AT THE CAVENDISH LABORATORY IN CAMBRIDGE, WERE ALSO WORKING ON THE MOLECULAR STRUCTURE OF DNA. BUT THE DIFFERENT TEAMS DID NOT COMMUNICATE WITH EACH OTHER...

CAMBRIDGE
- JANUARY
1953

THE EAGLE



CAMBRIDGE

...LINUS PAULING AND
HIS TEAM AT CALTECH IN
CALIFORNIA ARE GOING TO
DISCOVER THE MYSTERY OF LIFE
BEFORE US IF WE DON'T POOL
ALL OUR DATA TOGETHER.

THERE IS NO
WAY WE'RE LETTING
THOSE AMERICANS
BEAT US!! AH,
WILKINS!

'MM, THIS PINT
IS JUST WHAT
I NEEDED!

WHAT HAPPENED,
MAURICE?

FRANKLIN
KEEPS POINTING
OUT MY MISTAKES. THE
WORST PART IS THAT
SHE'S RIGHT.

AT LEAST YOU
WON'T RUN INTO
HER IN HERE! SHE'S
IN LONDON AND
SHE NEVER SETS
FOOT IN PUBS!

SHE PUTS ON
THOSE AIRS
BECAUSE MADAME
WORKED IN PARIS...

GOOD THING! WHOSE
BRIGHT IDEA WAS IT TO
LET WOMEN INTO
SCIENCE, ANYWAY?

SO WHAT WERE
YOU TALKING
ABOUT?

WE'RE THIS CLOSE TO MODELING
THAT DAMN DNA MOLECULE. BUT
WE'RE NOT THE ONLY ONES.

DID YOU KNOW THAT
FRANKLIN AND GOSLING
TOOK AMAZING IMAGES
VIA DIFFRACTION?

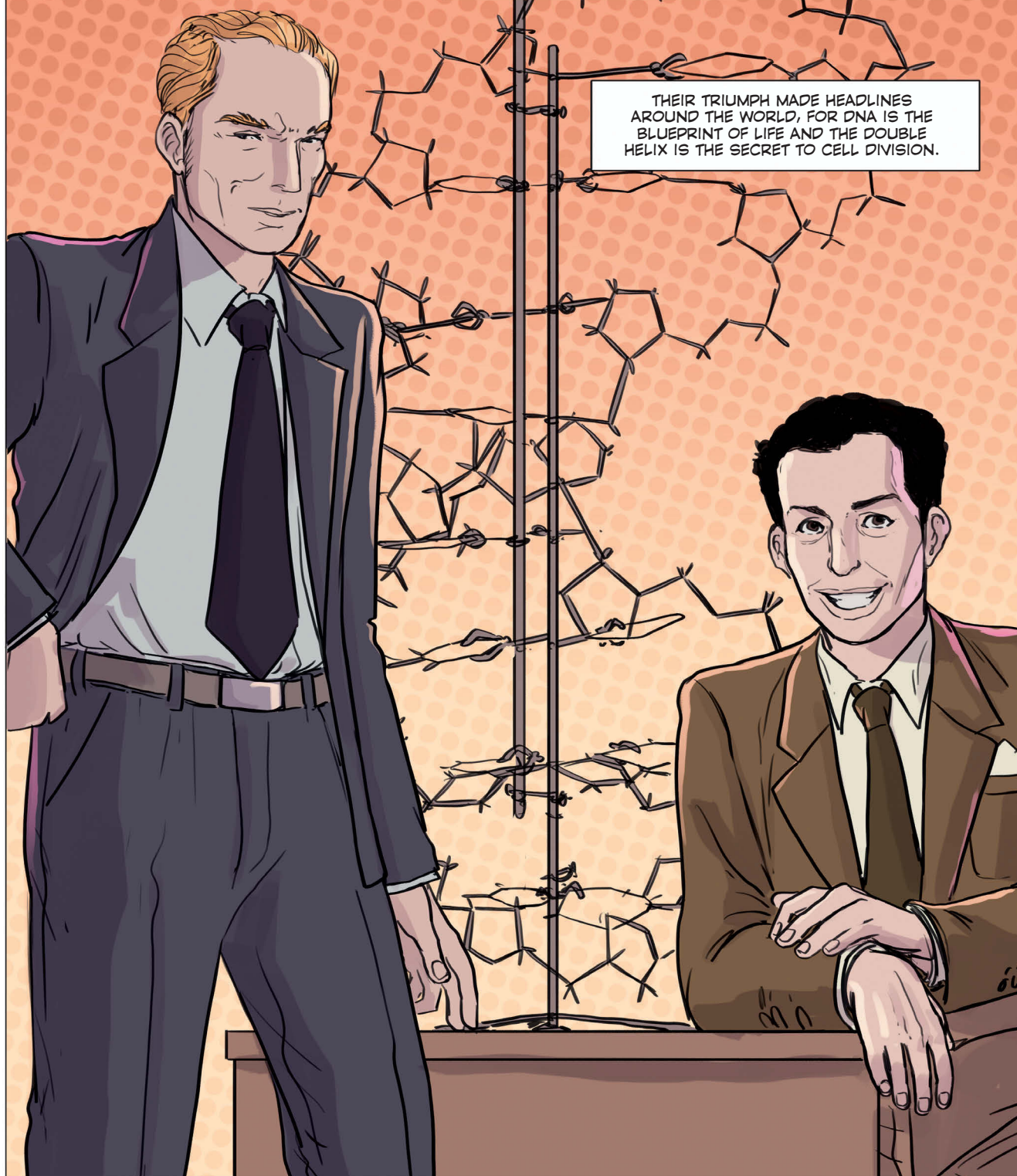
I HEAR THAT ON
HER IMAGES, THE DNA
FIBERS ARE BETTER
ALIGNED.

PUSHED TO THE SIDE BY THE TENSIONS IN HER LAB, ROSALIND FRANKLIN CHOSE TO LEAVE KING'S COLLEGE IN MARCH OF 1953, LEAVING BEHIND HER IMAGES OF DNA MOLECULES.

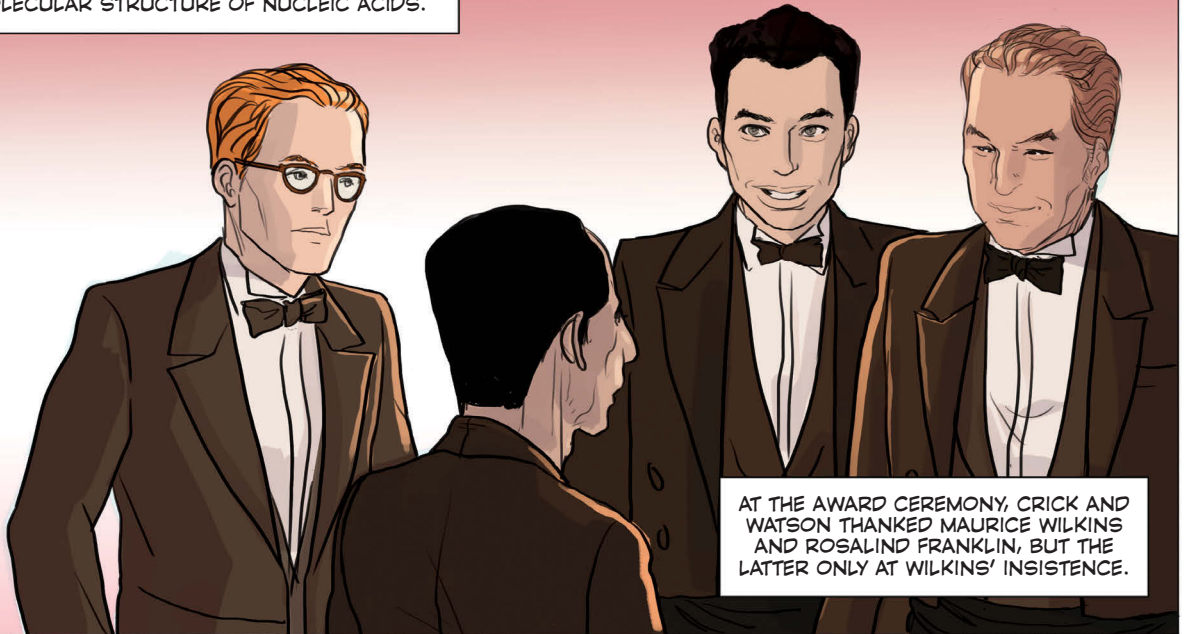
JAMES WATSON AND FRANCIS CRICK PUBLISHED THE RESULTS OF THEIR RESEARCH ON DNA'S DOUBLE HELIX STRUCTURE IN THE MAGAZINE *SCIENTIFIC NATURE* IN APRIL OF 1953...

...A STRUCTURE THAT COULD NOT HAVE BEEN CONFIRMED WITHOUT PHOTO NO. 51 TAKEN BY RAYMOND GOSLING UNDER THE DIRECTION OF ROSALIND FRANKLIN AND THANKS TO HER KNOWLEDGE OF CRYSTALLOGRAPHY.

THEIR TRIUMPH MADE HEADLINES AROUND THE WORLD, FOR DNA IS THE BLUEPRINT OF LIFE AND THE DOUBLE HELIX IS THE SECRET TO CELL DIVISION.



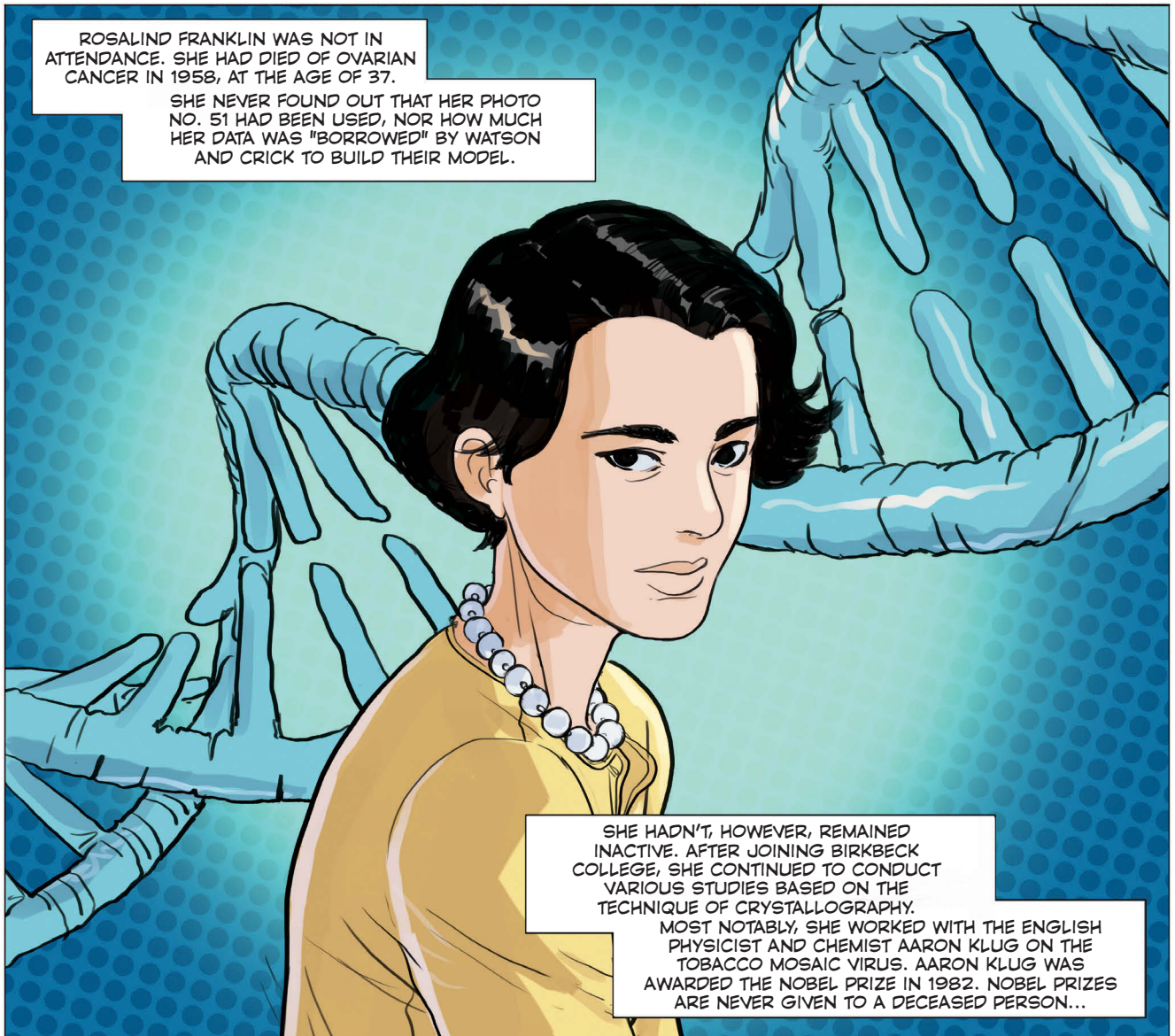
NINE YEARS LATER, ON OCTOBER 18, 1962, WATSON, CRICK AND WILKINS RECEIVED THE NOBEL PRIZE IN MEDICINE FOR THEIR WORK ON THE MOLECULAR STRUCTURE OF NUCLEIC ACIDS.



AT THE AWARD CEREMONY, CRICK AND WATSON THANKED MAURICE WILKINS AND ROSALIND FRANKLIN, BUT THE LATTER ONLY AT WILKINS' INSISTENCE.

ROSALIND FRANKLIN WAS NOT IN ATTENDANCE. SHE HAD DIED OF OVARIAN CANCER IN 1958, AT THE AGE OF 37.

SHE NEVER FOUND OUT THAT HER PHOTO NO. 51 HAD BEEN USED, NOR HOW MUCH HER DATA WAS "BORROWED" BY WATSON AND CRICK TO BUILD THEIR MODEL.



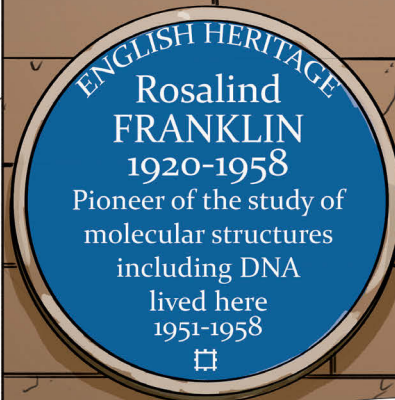
SHE HADN'T, HOWEVER, REMAINED INACTIVE. AFTER JOINING BIRKBECK COLLEGE, SHE CONTINUED TO CONDUCT VARIOUS STUDIES BASED ON THE TECHNIQUE OF CRYSTALLOGRAPHY.

MOST NOTABLY, SHE WORKED WITH THE ENGLISH PHYSICIST AND CHEMIST AARON KLUG ON THE TOBACCO MOSAIC VIRUS. AARON KLUG WAS AWARDED THE NOBEL PRIZE IN 1982. NOBEL PRIZES ARE NEVER GIVEN TO A DECEASED PERSON...

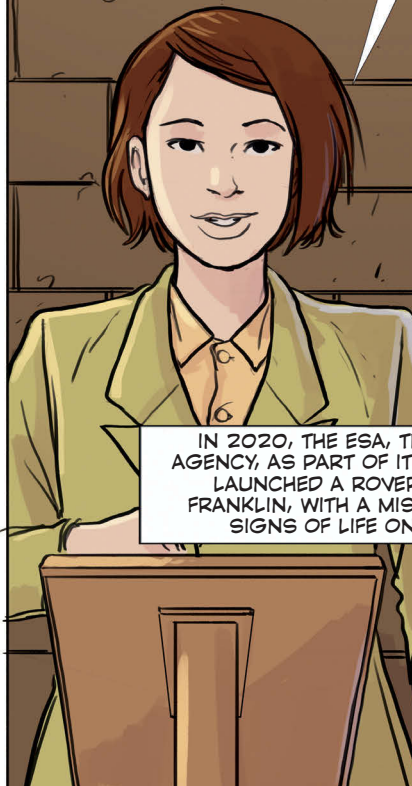
IN 1980, THE ROSALIND FRANKLIN EXAMPLE, AMONG OTHERS, HELPED SHAPE MARGARET ROSSITER'S "MATILDA EFFECT" THEORY,* ABOUT THE SYSTEMATIC DOWNPLAYING OF WOMEN'S CONTRIBUTION TO SCIENCE, WITH THEIR WORK OFTEN ATTRIBUTED TO THEIR MALE COLLEAGUES.

NEWNHAM COLLEGE, WHICH HAD NOT ORGANIZED A TRIBUTE CEREMONY WHEN SHE DIED, NAMED ONE OF THE DORMS AFTER HER AND COMMISSIONED A BUST IN HER HONOR.

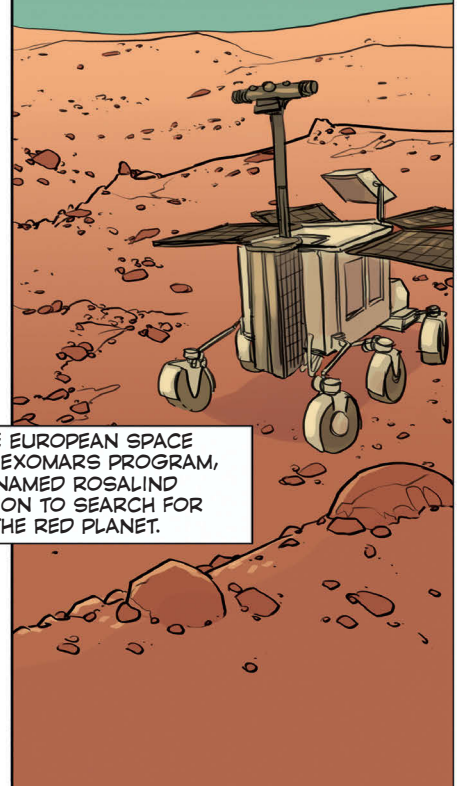
AND ENGLISH HERITAGE HAD A COMMEMORATIVE BLUE PLAQUE INSTALLED ON THE FRONT OF HER LONDON HOME.



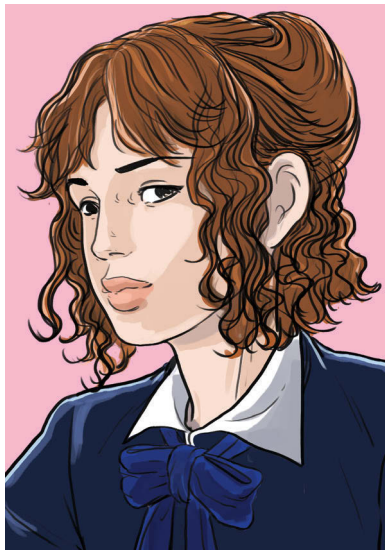
ROSALIND FRANKLIN NEVER RECEIVED THE RECOGNITION SHE DESERVED. OUR GOAL IS TO CELEBRATE THE MEMORY OF INFLUENTIAL WOMEN, FOR ONLY 10% OF THE SIX HUNDRED PLAQUES WE HAVE PUT UP OVER THE COURSE OF 125 YEARS HAVE HONORED WOMEN.



IN 2020, THE ESA, THE EUROPEAN SPACE AGENCY, AS PART OF ITS EXOMARS PROGRAM, LAUNCHED A ROVER NAMED ROSALIND FRANKLIN, WITH A MISSION TO SEARCH FOR SIGNS OF LIFE ON THE RED PLANET.



* NAMED AFTER AMERICAN SUFFRAGIST AND ABOLITIONIST MATILDA JOSLYN GAGE.



Sophie Germain

1776 - 1831

French mathematician, philosopher and physicist.

Sophie Germain was born in Paris in 1776 and learned mathematics on her own by reading the many books in the family library. Despite initial parental disapproval, she refused to get discouraged, and her obstinacy eventually won over her parents, who supported her when she was accepted at the recently founded Polytechnic School by pretending to be a boy named Antoine-Auguste Le Blanc.

It was under that identity that she corresponded with Joseph-Louis Lagrange (a mathematician, mechanic and astronomer), who eventually discovered the subterfuge. Impressed, he too decided to offer her his support.

She began working on Fermat's theorem, performed a demonstration on prime numbers and a series of experiments on the vibrations of elastic surfaces. She wrote three papers comparing the experiment and the mathematical theory of elastic surfaces. She became the first woman to win the Grand Prize for Mathematical Sciences from the Academy of Sciences.

Despite all these accomplishments, she was never accepted as an equal of men and she felt alone and foreign in the scientific community. She died at the age of 55 before receiving an honorary doctorate from by the University of Gottingen.



Irène Joliot-Curie

1897 - 1956

French chemist and physicist
Nobel Prize in Chemistry 1935
(shared with Frédéric Joliot)



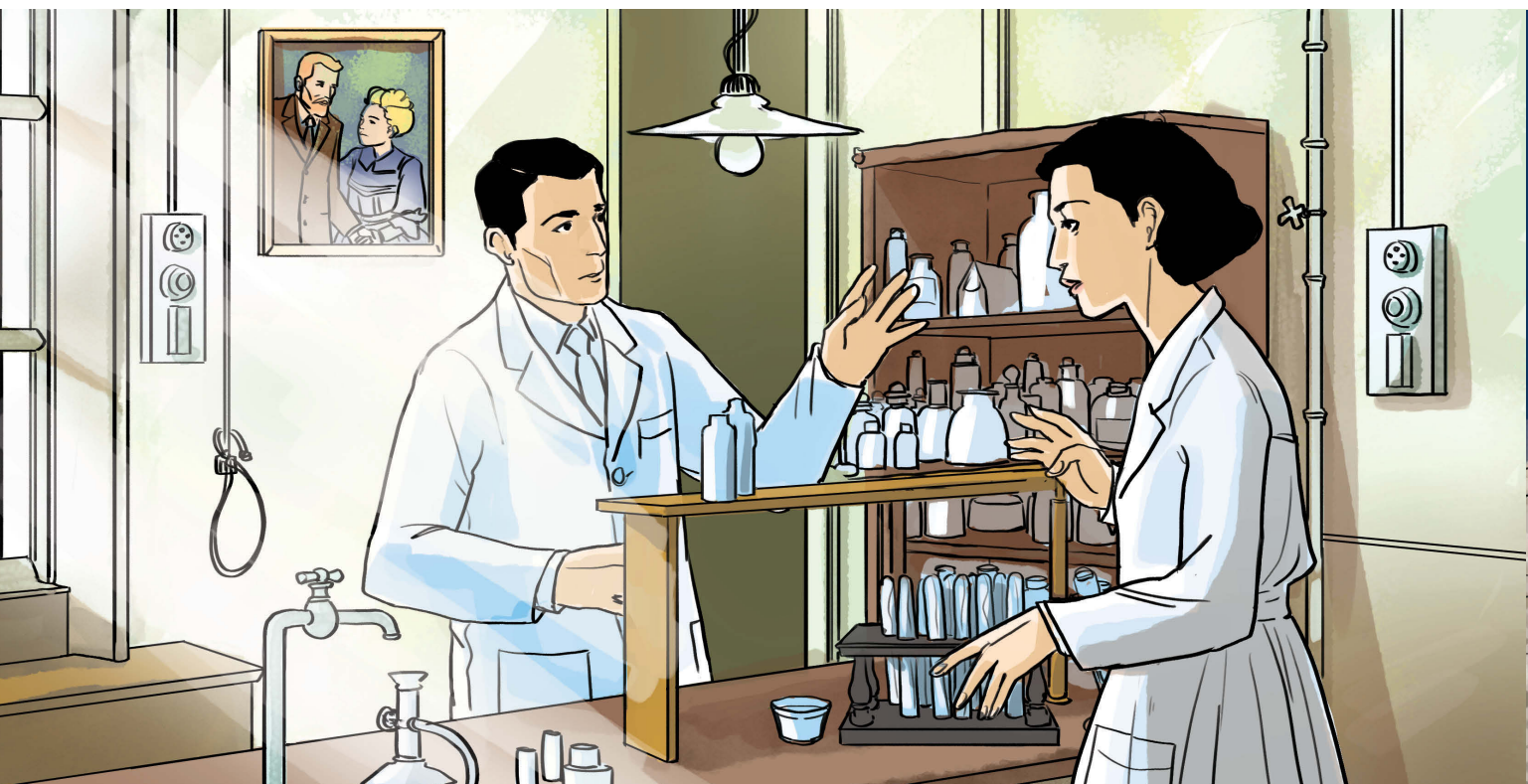
The daughter of illustrious scientists Pierre and Marie Curie, **Irène Joliot-Curie** was born in Paris in 1897. Immersed early on in a family atmosphere steeped in science and research, Irene quite naturally followed in her parents' footsteps and, after obtaining her baccalauréate, enlisted in the war as a radiologist nurse and surgical assistant.

After World War I ended, she became her mother's assistant at the Radium Institute in Paris.

There, she met another research scientist, Frederic Joliot, whom she fell in love with and married. They had two children together and also shared the 1935 Nobel Prize in chemistry for their discovery of artificial radioactivity.

Irène Joliot-Curie was also a dedicated advocate for women's rights and was appointed to the post of secretary of state for scientific research under the left-wing Front Populaire government in June 1936, even though women didn't yet have the right to vote.

A professor and the director of the Radium Institute, she died at the age of 58, likely as a result of the significant amount of radiation to which she was exposed.





Jocelyn Bell Burnell

1943 -

Irish astrophysicist
Breakthrough Prize 2018

Jocelyn Bell Burnell was born in 1943 in Belfast, Northern Ireland. She had a strong interest in astronomy as a child, which was only reinforced when she accompanied her father to the Armagh Planetarium, where he worked.

While a student at Cambridge University, she helped build a radio telescope and used it every day until one bright spot intrigued her enough to write down data and analyze the findings, which, in 1967, led to her discovery of pulsars, stellar objects that produce a periodic signal.

This was such a monumental discovery in the field of astronomy that Anthony Hewish, her research supervisor as well as her collaborator, was awarded the Nobel Prize in Physics in 1974.

Jocelyn, who had continued her research despite Hewish's doubts, was not nominated.

But 51 years after her discovery, in 2018, she finally received the recognition she deserved. She was awarded the Breakthrough Prize in Fundamental Physics with an endowment of three million dollars in recognition of her work and her influence on the scientific community.

She used the money for a scholarship fund for minority students to study advanced physics at Oxford.



MAE JEMISON

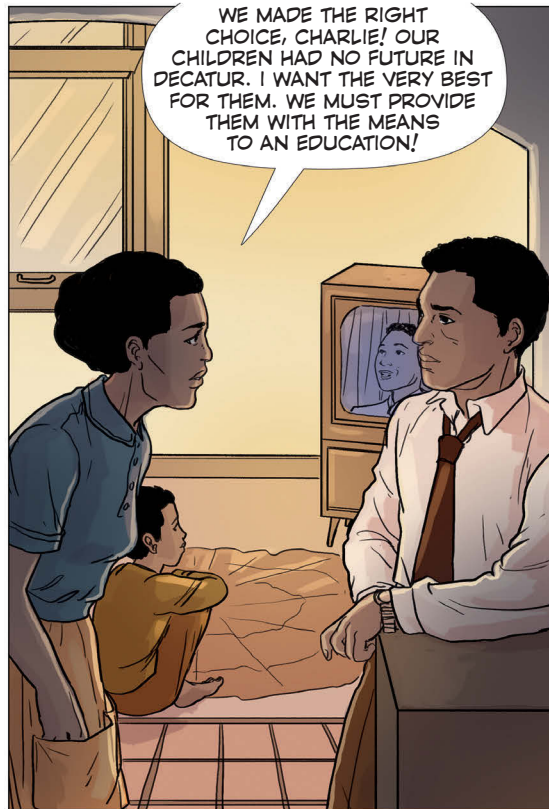


1956 -
American Astronaut
Buzz Aldrin's Space Pioneers Award - 2017

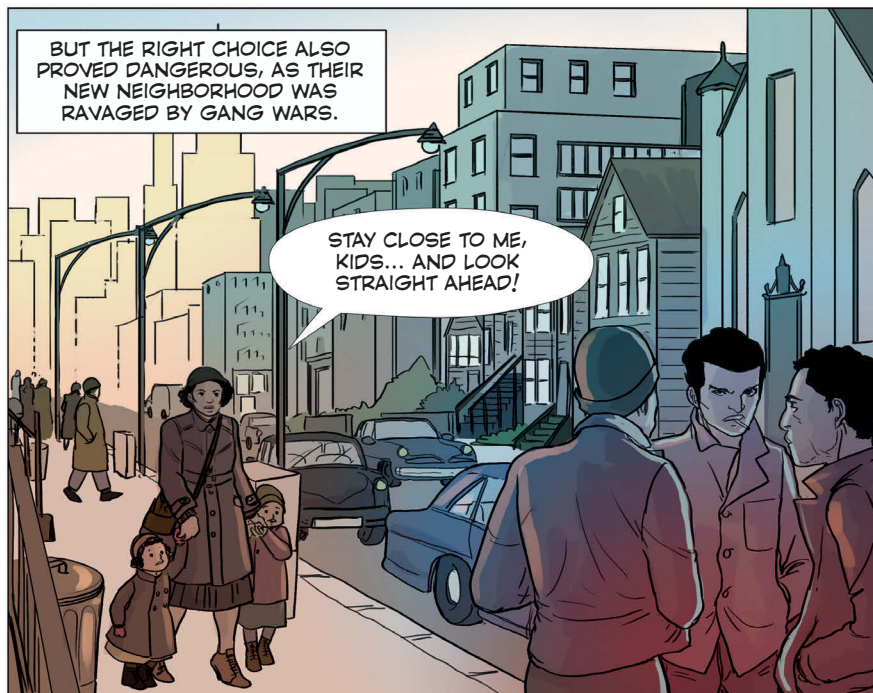
MAE CAROL JEMISON WAS BORN ON OCTOBER 17, 1956, IN DECATUR, ALABAMA. THE LAST OF THREE CHILDREN, SHE WAS THREE WHEN HER FAMILY MOVED TO CHICAGO, ILLINOIS.



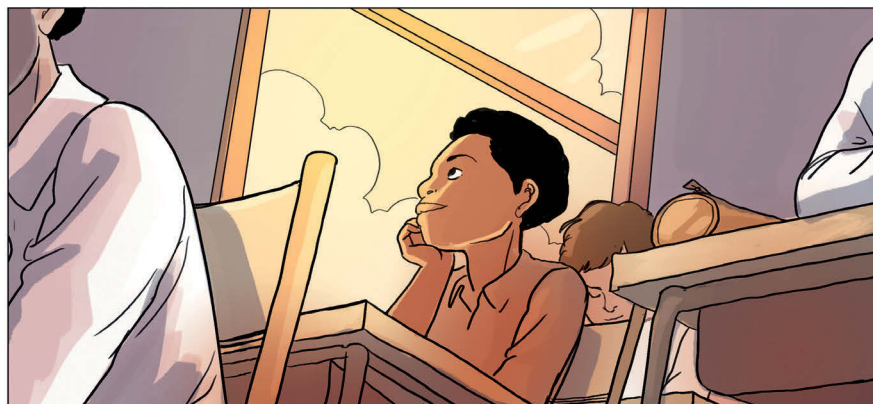
WE MADE THE RIGHT CHOICE, CHARLIE! OUR CHILDREN HAD NO FUTURE IN DECATUR. I WANT THE VERY BEST FOR THEM. WE MUST PROVIDE THEM WITH THE MEANS TO AN EDUCATION!



BUT THE RIGHT CHOICE ALSO PROVED DANGEROUS, AS THEIR NEW NEIGHBORHOOD WAS RAVAGED BY GANG WARS.

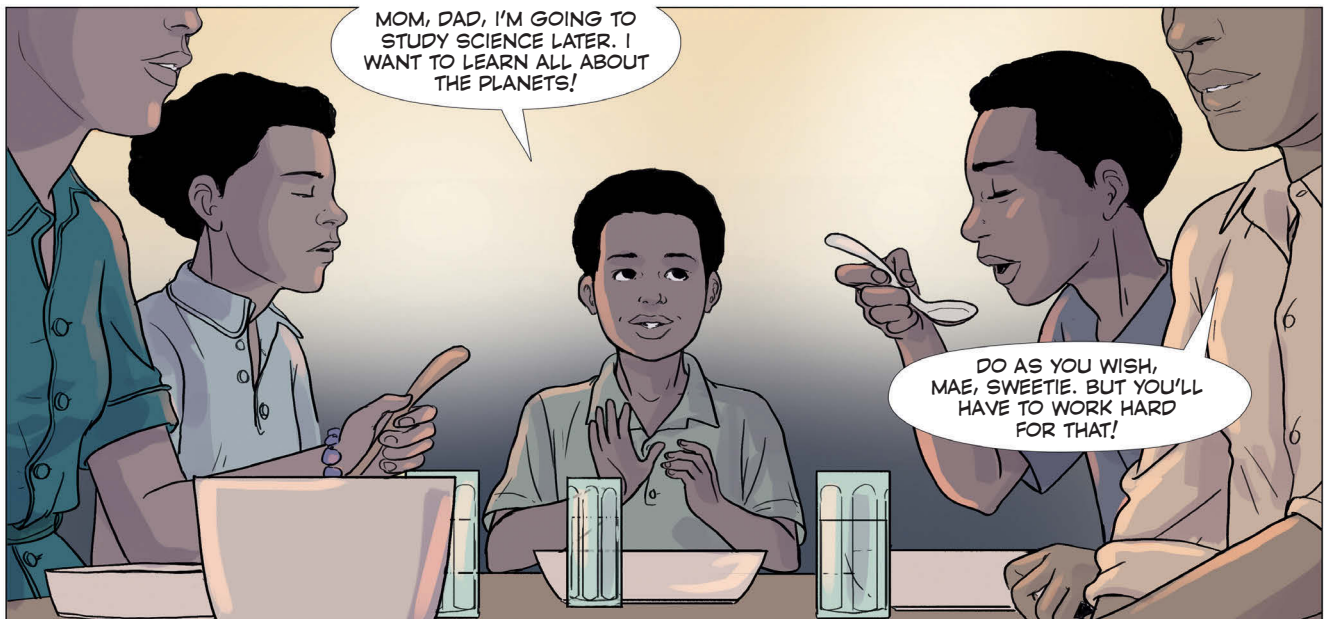


STAY CLOSE TO ME, KIDS... AND LOOK STRAIGHT AHEAD!



WE CAN'T STAY HERE, CHARLIE. LET'S HOPE OUR NEXT NEIGHBORHOOD IS MORE PEACEFUL...



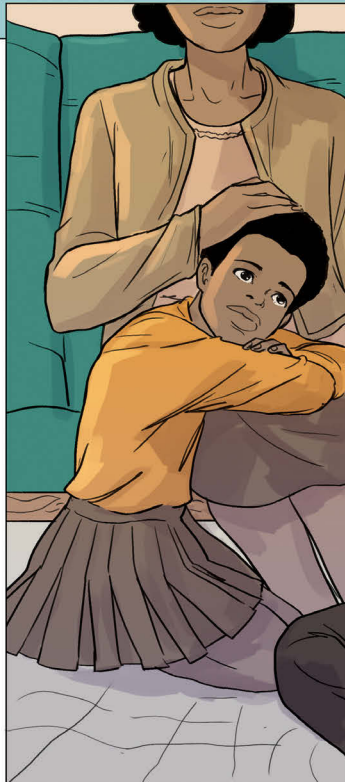


...WE INTERRUPT OUR PROGRAMMING... WE JUST LEARNED THAT THE REVEREND MARTIN LUTHER KING, JR. WAS ASSASSINATED AN HOUR AGO...

IT'S BEEN CONFIRMED. HE WAS SHOT IN THE HEAD OUTSIDE HIS HOTEL ROOM IN MEMPHIS...

BE VERY CAREFUL, KIDS. STAY TOGETHER AND COME STRAIGHT HOME.

WE NEED TO KNOW YOU'RE TOGETHER.

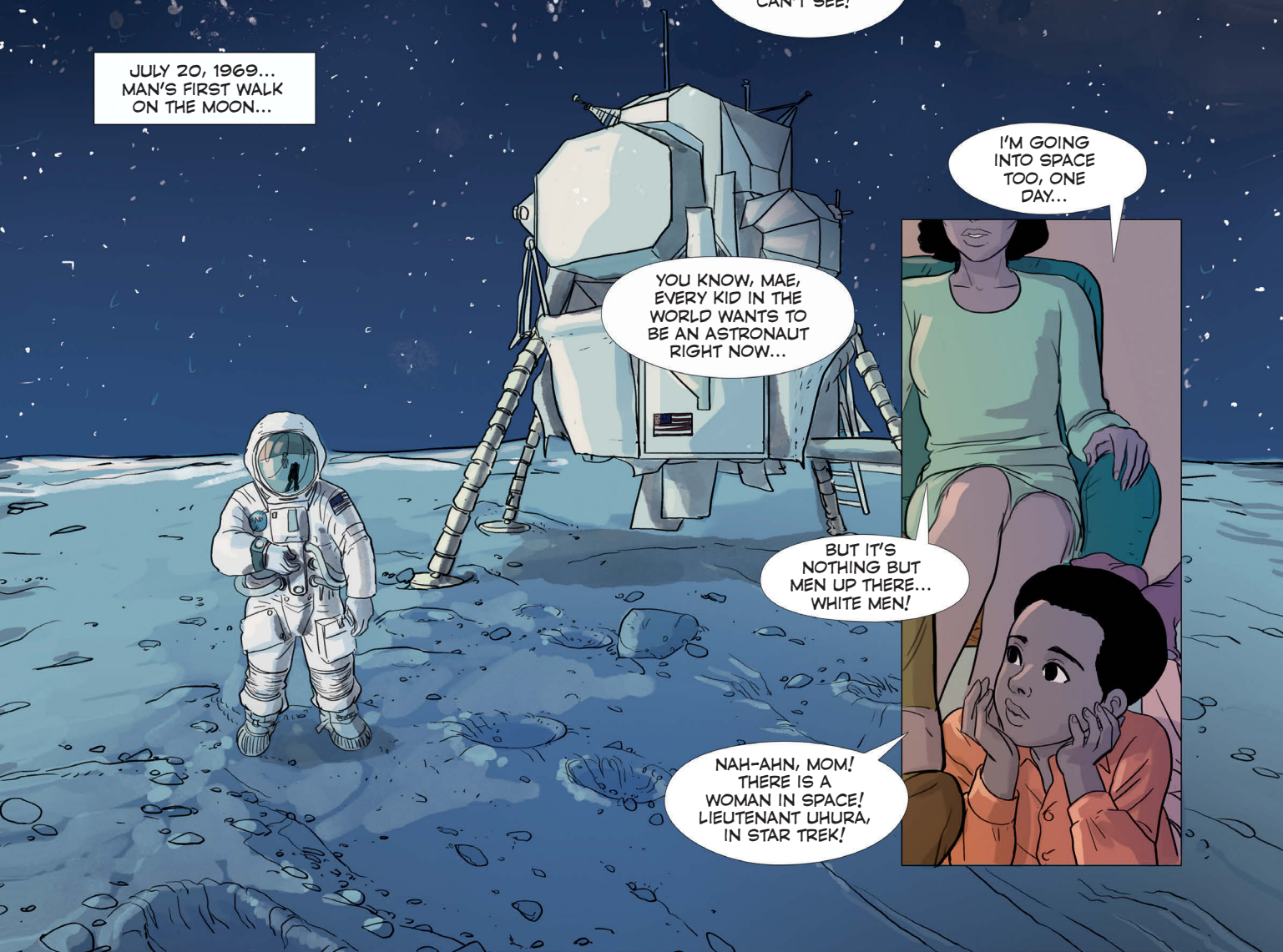




THIS IS IT!
THEY'RE
COMING OUT!

CALM DOWN,
KIDS. AND MOVE
OVER... WE
CAN'T SEE!

JULY 20, 1969...
MAN'S FIRST WALK
ON THE MOON...



YOU KNOW, MAE,
EVERY KID IN THE
WORLD WANTS TO
BE AN ASTRONAUT
RIGHT NOW...

I'M GOING
INTO SPACE
TOO, ONE
DAY...

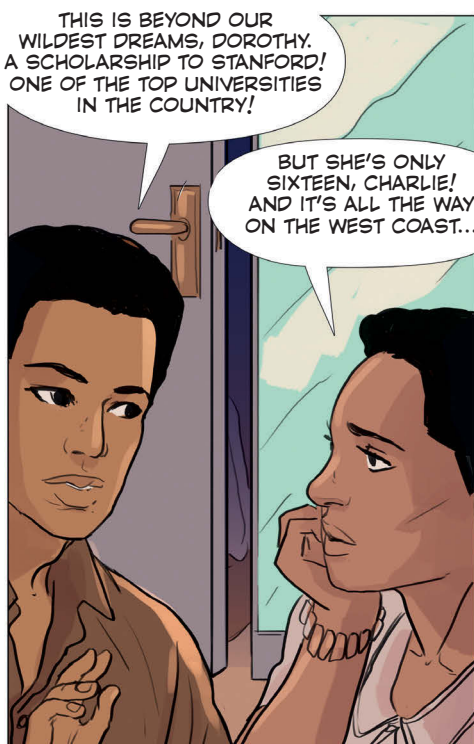
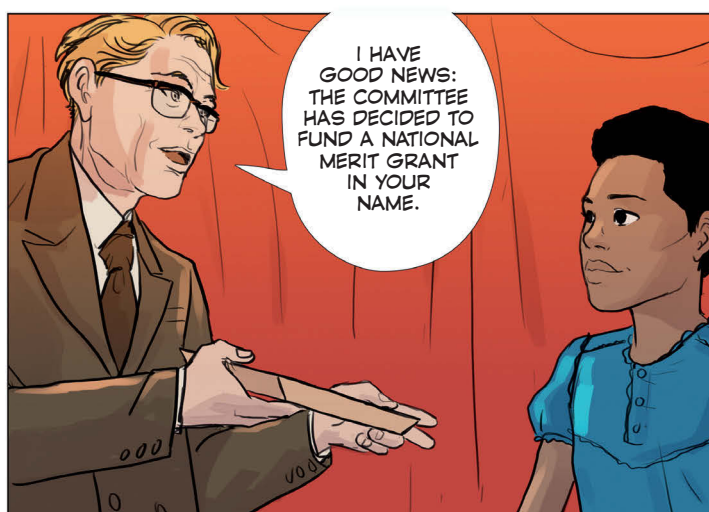
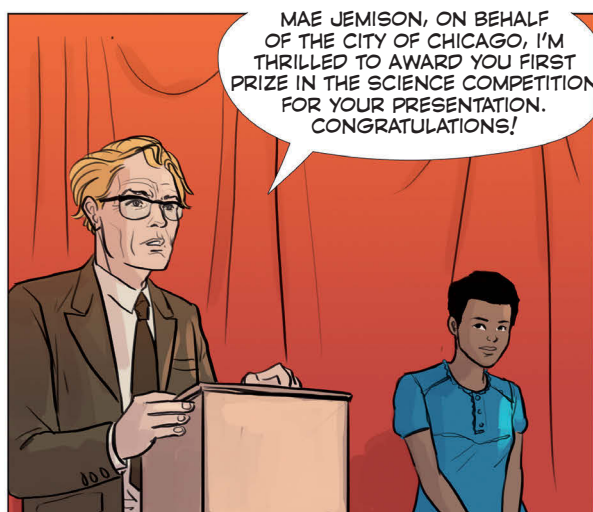
BUT IT'S
NOTHING BUT
MEN UP THERE...
WHITE MEN!

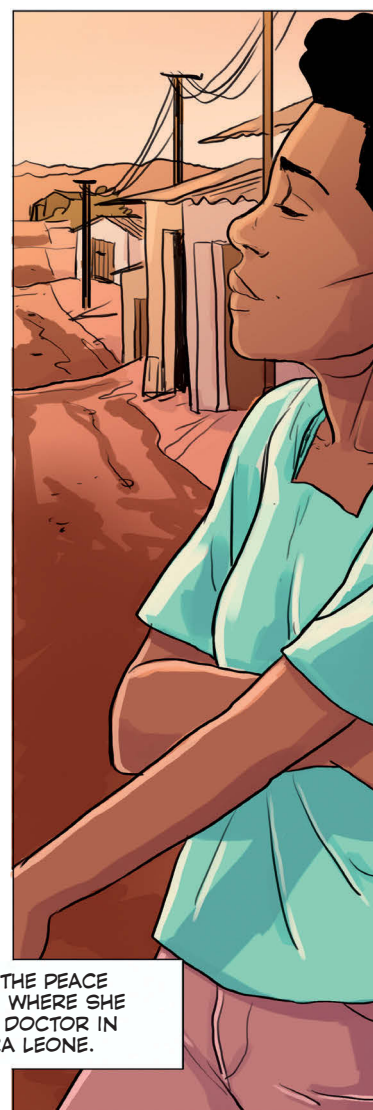
NAH-AHN, MOM!
THERE IS A
WOMAN IN SPACE!
LIEUTENANT UHURA,
IN STAR TREK!

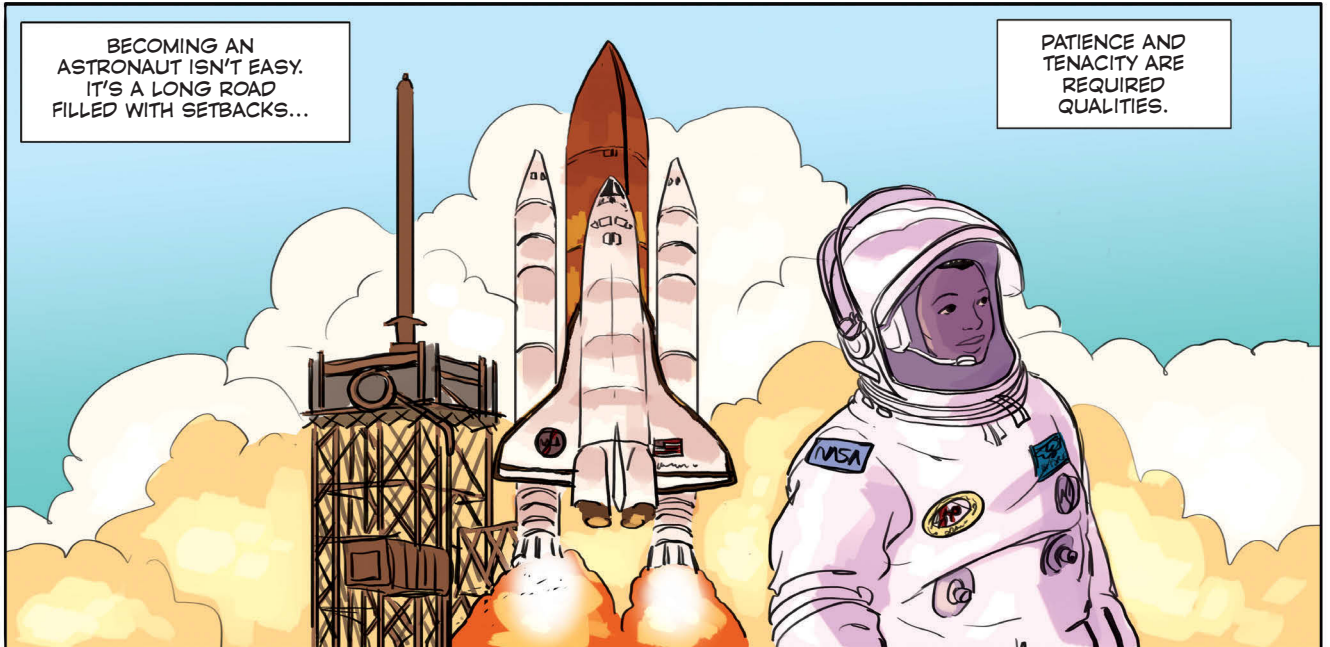
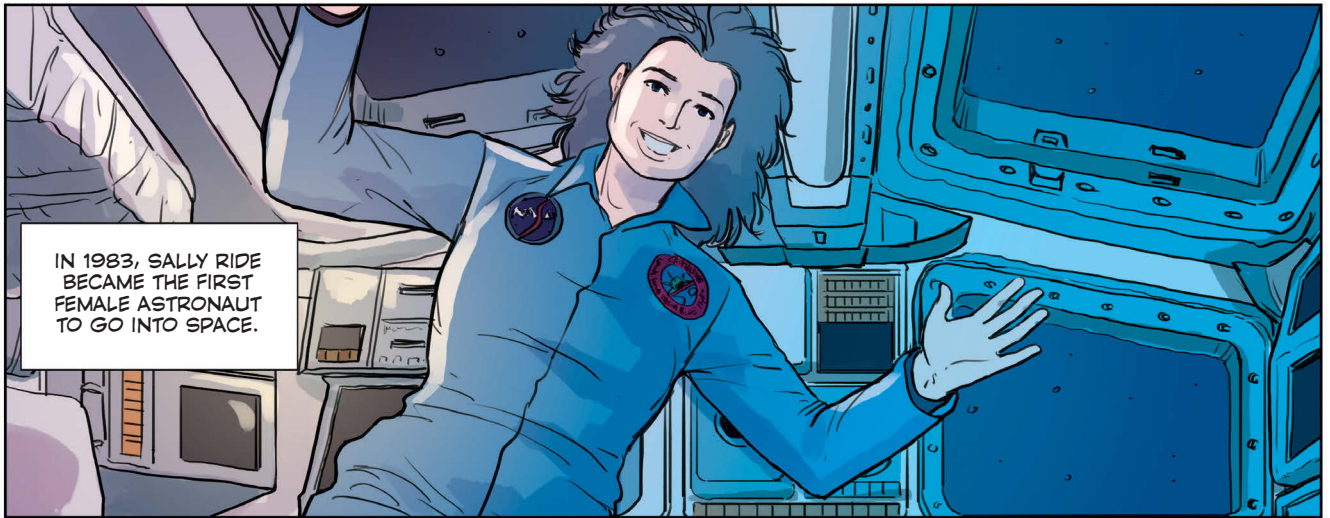


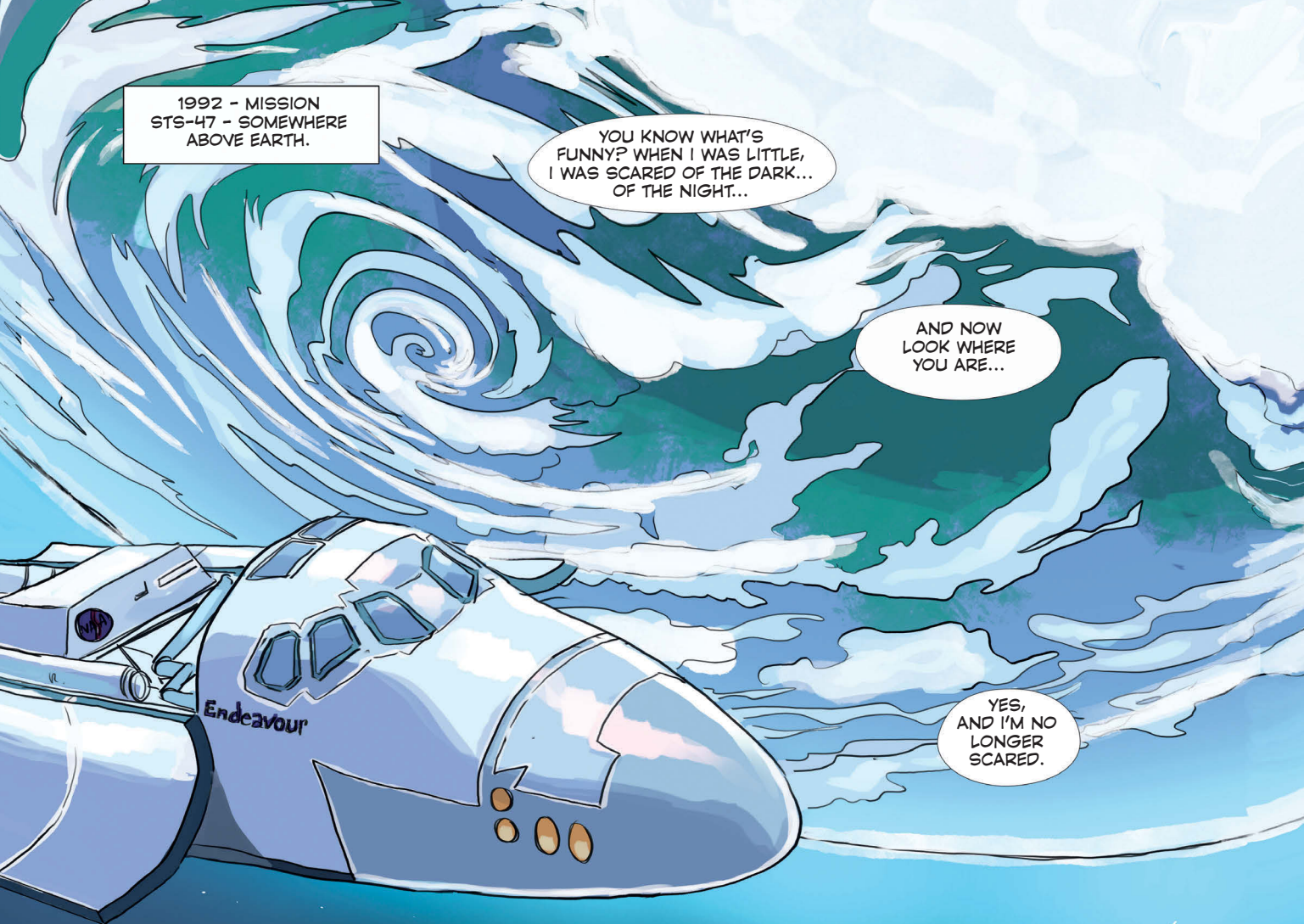
SIGH YOU DON'T EVEN
KNOW THE DIFFERENCE
BETWEEN FICTION AND
REALITY, MAE...

CHARLES! LEAVE
YOUR SISTER ALONE!









1992 - MISSION
STS-47 - SOMEWHERE
ABOVE EARTH.

YOU KNOW WHAT'S
FUNNY? WHEN I WAS LITTLE,
I WAS SCARED OF THE DARK...
OF THE NIGHT...

AND NOW
LOOK WHERE
YOU ARE...

YES,
AND I'M NO
LONGER
SCARED.



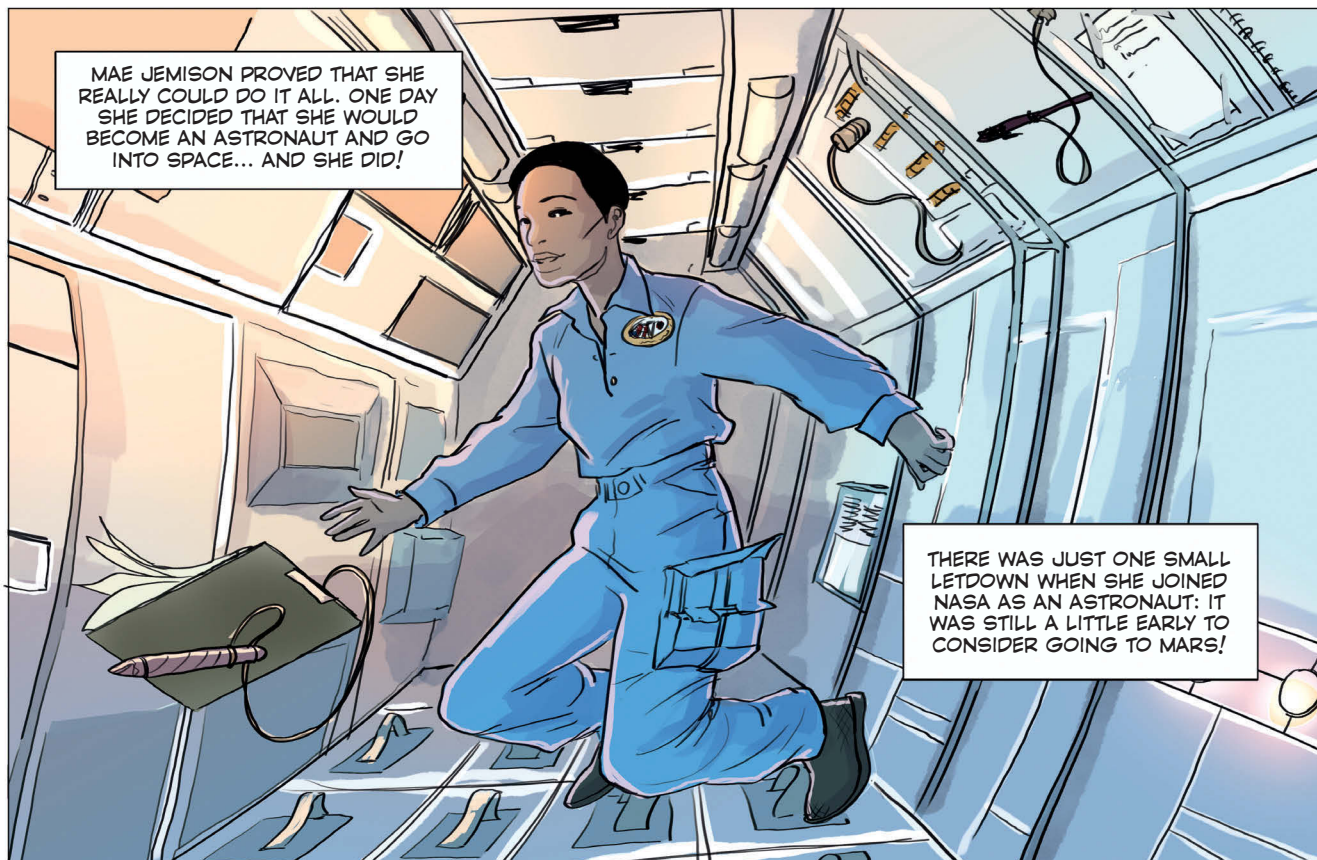
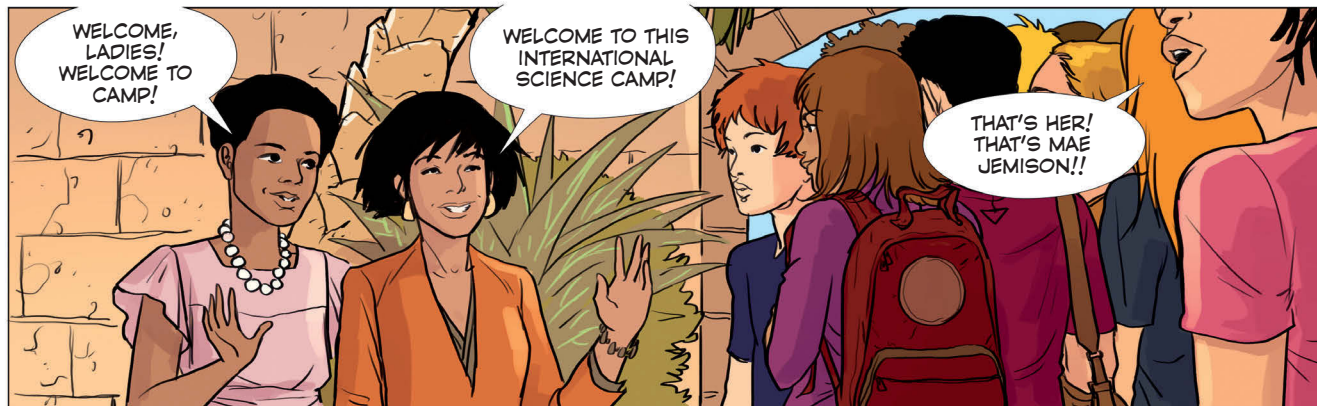
LOOK, WE'RE
RIGHT ABOVE
YOUR TOWN.

OH...
HI,
CHICAGO!



I'M SO GLAD I DID
THIS AS A WOMAN AND AS
A MINORITY. WE HAVE JUST
SHOWED THE WORLD THAT
WE CAN CONTRIBUTE TO THE
ADVANCE OF SOCIETY AS
WELL AS ANYONE.

A FEW YEARS LATER...



Stephanie Kwolek

1923 - 2014

American chemist



Stephanie Kwolek was born in Pennsylvania in 1923 to a family of Polish extraction. Her father, a naturalist, died when she was ten years old, but not before sharing his love of trees and nature with his daughter. Her mother, a seamstress, gave her a taste for fashion, a field that Stephanie could have chosen as a career.

But she eventually opted for science instead, and graduated from Carnegie Mellon University's Margaret Morrison Carnegie College, a women's college, with a degree in chemistry.

To finance her studies, she landed a small job at Dupont, an innovative chemistry company that revolutionized stockings with the invention of nylon in the 1930s.

It was while working at that company that she looked for a way to make car tires stronger and discovered Kevlar, a particularly strong fiber.

Five times stronger than steel and extremely lightweight, it is used today for bulletproof vests, airplanes, ships, appliances, and for just about anything that requires extreme resistance.

The multiple award-winning Stephanie Kwolek was inducted into the National Women's Hall of Fame in 2003.





Grace Murray Hopper

1906 - 1992

American computer scientist
Presidential Medal of Freedom

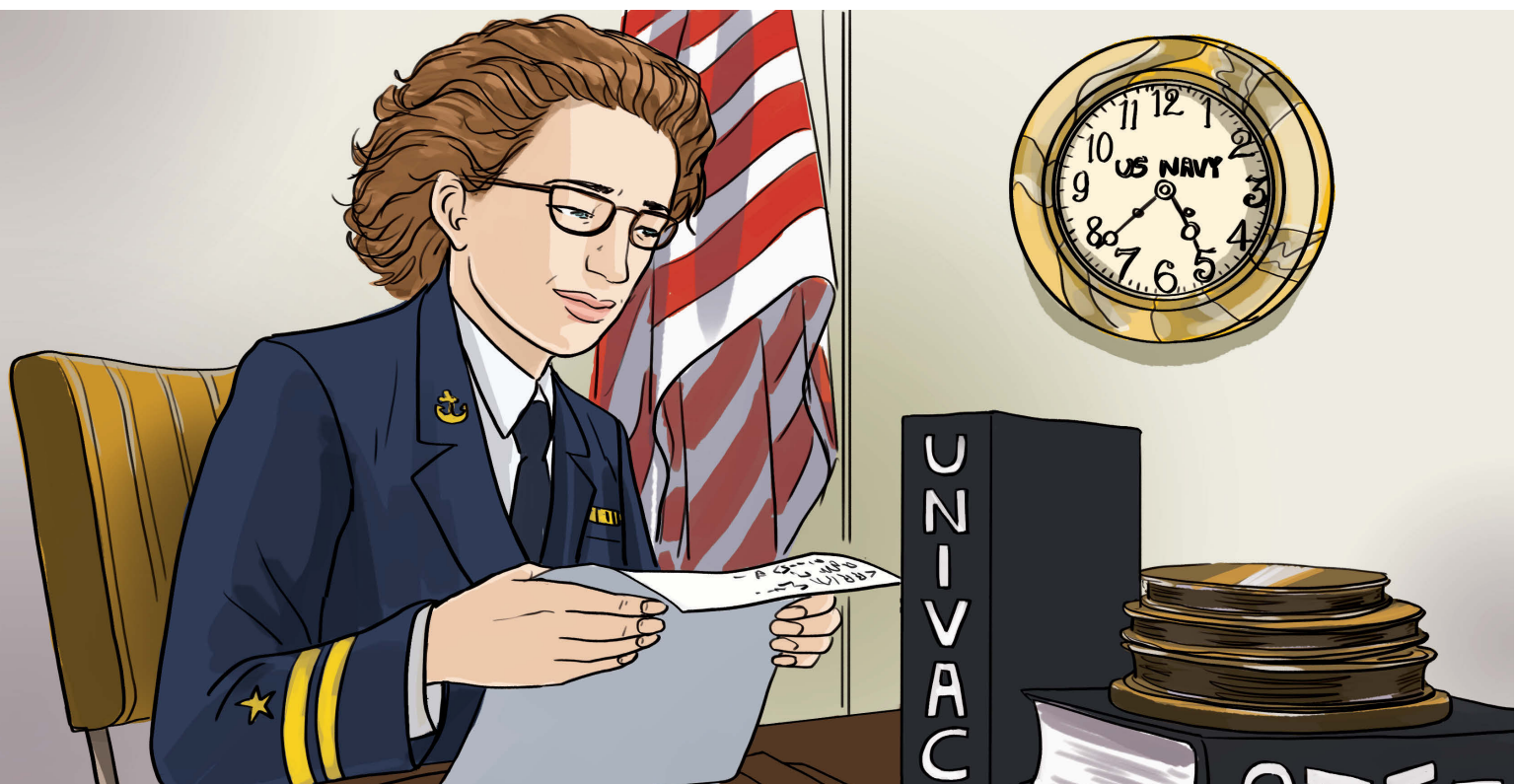
Grace Murray Hopper was born in 1906 in New York to a military family.

Passionate about mathematics, she earned a PhD in mathematics from Yale University and then taught the subject at Vassar College, where she was an associate professor for several years before she enlisted in the Navy, inspired by the family military tradition. Up until she retired from the U.S. Navy at the age of 60, she was the oldest officer there and held the high rank of Rear Admiral.

As someone who enjoyed thinking outside the box, she kept the clock in her office running counter clockwise in order to remind herself that she was there to change the way people thought.

This mindset is what led her to question why computers could only do arithmetic and only expressed themselves with symbols. Imagining that everyone would one day have access to this technology, she sought to go beyond that function and in 1959 came up with a much more accessible computer programming language: COBOL.

In 2016, Barack Obama posthumously awarded her the Presidential Medal of Freedom.



Xie Yi

1967 –

Chinese chemist
2015 L'Oréal-Unesco Women and Science Award

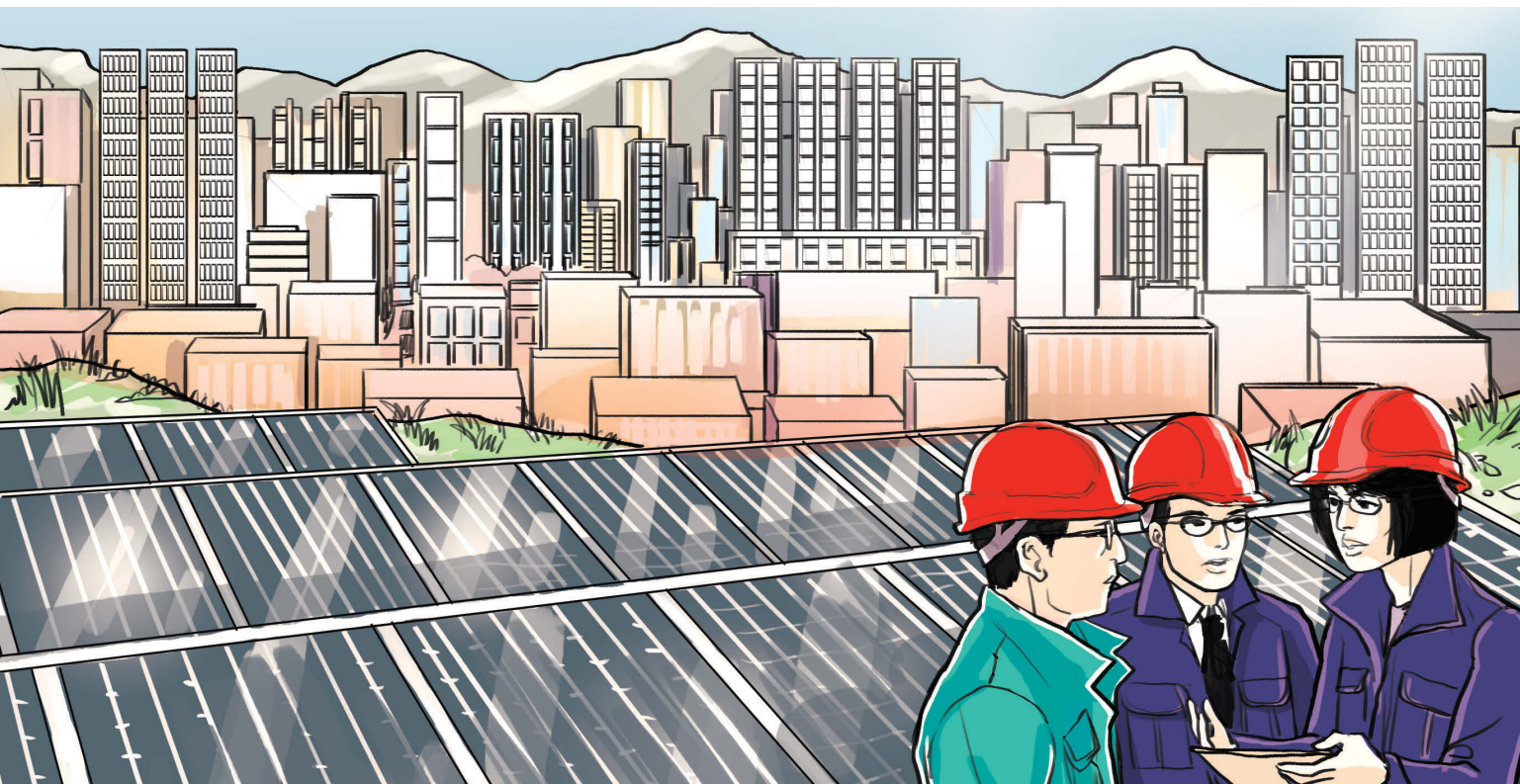


Born in 1967 in Fuyang, in the Anhui province in Eastern China, **Xie Yi** earned a degree in chemistry in 1988 from Xiamen University, in the province of Fujian.

She started her career as an assistant engineer in a chemical factory before resuming her studies, this time at the University of Science and Technology of China, where she earned a PhD. Her research focused on nanotechnology, and in particular on thermoelectricity, the harnessing and transformation of solar energy into electricity. She was also dedicated to the fight against pollution.

In 2013, Yi was elected fellow of the Royal Society of Chemistry (United Kingdom) and fellow of the Chinese Academy of Sciences

In 2014, she received the TWAS (Third World Academy of Sciences) scientific award, and in 2015, she received a L'Oréal-Unesco Women and Science Award.



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