

RADIOACTIVE

MARIE & PIERRE CURIE

A TALE

OF

LOVE & FALLOUT

by Lauren Redniss

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Frédéric Chopin (1810–1849), composer, pianist. (Hand cast, Bibliothèque Polonaise, Paris.)

Marie Curie had named her first element polonium to bring attention to her homeland but was disappointed to find it overshadowed by her second discovery, radium. We pause here to grant Marie's original wish. Here is a select array of luminaries, flora and fauna from the land known today as Poland:

CASIMIR FUNK (1884–1967), biochemist; credited with first understanding of vitamins.
 JOSEPH CONRAD (1857–1924), novelist.
 JOSEPH ROTBLAT (1908–2005), physicist, only scientist to resign from the Manhattan Project once it was understood, in 1944, that there was to be no German atomic weapon, winner of the Nobel Peace Prize, 1995.
 CZESŁAW MIŁOSZ (1911–2004), poet, writer, Nobel Prize for Literature, 1980.
 STANISŁAW LEM (1921–2006), philosopher, writer of science fiction novels including *Solaris*; asteroid 3836 Lem is named in his honor.
 RYSZARD KAPUŚCIŃSKI (1932–2007), journalist and writer.

ADAM MICKIEWICZ (1798–1855), Romantic poet.

LECH WAŁĘSA (born 1943), car mechanic, electrician, father of eight, co-founder of the Solidarity movement, winner of the Nobel Peace Prize, president of Poland (1990–1995).
 HENRYCK ARCTOWSKI (1871–1958), explorer of the Antarctic; the phenomenon of a rainbow-like halo, created as light around the sun passes through ice crystals, bears his name.
 BIURO SZYFRÓW: The Polish Cipher Bureau; broke the German Enigma code.
 ELIE NADELMAN (1882–1946), artist, sculptor whose work includes delicate carvings of dancing couples as well as the colossal figures in the lobby of the New York State Theater at Lincoln Center.

CHYKA GROSSMAN (1919–1996), a leader in the Polish underground in World War II, active in ghetto uprisings; later, Zionist leader and member of the Israeli Knesset.
 TEODOR TALOWSKI (1857–1910), architect known for asymmetrical buildings with whimsical ornament (a singing frog, a spider and a sundial, a crying mule), and Latin inscriptions (e.g., *Festina lente* — hurry slowly).

DAVID BEN-GURION (1886–1973), first prime minister of Israel.

KRYSZYNA CHOJNOWSKA-LISKIEWICZ (born 1936), first woman to sail solo around the world, traveling 31,166 nautical miles in 401 days.

HALINA KONOPACKA (1900–1989), winner of Poland's first Olympic gold medal (for the discus throw) during the 1928 games in Amsterdam.

LUCYNA ĆWIERCZAKIEWICZOWA (1829–1901), writer; author of the first Polish cookbook, *Jedynie Praktyczne Przepisy Wszelkich Zapasów Spizarnianych Oraz Pieczenia Ciast* (The Only Practical Compendium of Recipes for All Household Stocks and Pastry), 1858.

MORDECHAJ ANIELEWICZ (1919–1943), commander of the Żydowska Organizacja Bojowa (Jewish Fighting Organization) during the Warsaw Ghetto Uprising.

ISAAC BASHEVIS SINGER (1902 or 1904–1991), writer, champion of Yiddish literature, vegetarian, winner of the Nobel Prize for Literature, 1978.

COUNT JAN NEPOMUCEN POTOCKI (1761–1815), Egyptologist, first Pole to fly in a hot air balloon, 1790.

TAMARA DE LEMPICKA (1898–1980), glamorous, bisexual Art Deco painter of heavy-lidded women with red lips and marble-smooth curves enfolded in satin.

DANIEL LIBESKIND (born 1946), child accordion virtuoso, architect.

ARTHUR RUBINSTEIN (1887–1982), pianist.

MAREK EDELMAN (1922–2009), cardiologist, political and social activist, one of the leaders of the Warsaw Ghetto Uprising.

JAN KARSKI (1914–2000), World War II resistance fighter; played critical role in informing the West of plight of Polish Jewry in Warsaw Ghetto and extermination camps.

WISŁAWA SZYMBORSKA (born 1923), poet, essayist, translator, winner of the Nobel Prize in Literature, 1996.

BRONISŁAW MALINOWSKI (1884–1942), anthropologist, author of *Argonauts of the Western Pacific*, *The Sexual Life of Savages in North-Western Melanesia*, and *Coral Gardens and Their Magic*.

ZYGMUNT BAUMAN (born 1925), philosopher, coined term "Liquid Modernity."

LESZEK KOŁAKOWSKI (1927–2009), philosopher, critic of Marxism.

POPE JOHN PAUL II (Karol Józef Wojtyła) (1920–2005), Pope and Sovereign of the State of the Vatican City from October 16, 1978, until his death; the first non-Italian Pope since the 1520s; his was the second-longest pontificate in history.

VLADEK SPEIGELMAN: Auschwitz prisoner and survivor

195113, father of Art Spiegelman,

protagonist of Spiegelman's graphic novel *Maus*.

JAN ŁUKASIEWICZ (1878–1956), mathematician.

TADEUSZ KOŚCIUSZKO (1746–1817), military leader, hero in uprising against Imperial Russia, colonel in American Revolution, emancipator of American slaves.

ANTONI NORBERT PATEK (1811–1877), watchmaker, founder of Patek Philippe & Co., creators of the nine-hundred-part Supercomplication pocket watch (1933), which garnered the highest price on record for a watch sold at auction, in 1999 (\$11 million).

SAMUEL ORGELBRAND (1810–1868), publisher of the first modern Polish-language encyclopedia, *Encyklopedia Powszechna*.

NATHAN HANDWERKER (1892–1974), founder of Nathan's Famous, the hot dog company.

ANDRZEJ WAJDA (born 1926), film director, winner of the Palme d'Or at Cannes for *Man of Iron*, about the Solidarity movement, 1981.

HELENA MODRZEJEWSKA (1840–1909), Shakespearean actress, cofounder of a utopian colony in California, 1876; the inspiration for Susan Sontag's novel *In America*.

FLORA

SILVER THISTLE (silver-white, spiny-petalled)

GREAT SUNDEW (insect-trapping, tentacled)

TOADFLAX (caramel-colored, snapdragon-like)

FAUNA

WILD GROUSE (varied vocalizations, conspicuous preening)

WILD BOAR (nocturnal foragers)

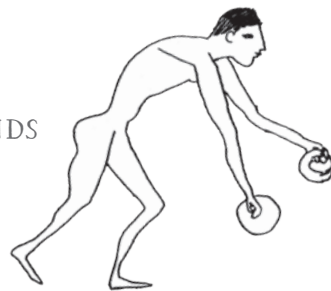
MARMOTS (highly social, good whistlers)

EUROPEAN BISON (nocturnal, solitary)

RADIOACTIVE DECAY

Radioactive elements are unstable. They undergo spontaneous decay. That is, the unstable nucleus emits energetic particles and radiation, thus transforming into an isotope of a different element. This process continues until a stable form is reached. "Half-life" is the amount of time it takes for half of the nuclei of a given sample to undergo radioactive decay. The primary element is called the "parent"; the product is referred to as the "daughter" element.

<u>ISOTOPE</u>	<u>HALF-LIFE</u>
URANIUM-238	4½ BILLION YEARS
THORIUM-234	24 DAYS
PROTACTINIUM-234	1.16 MINUTES
URANIUM-234	245,500 YEARS
THORIUM-230	75,380 YEARS
RADIUM-226	1,620 YEARS
RADON-222	3.8 DAYS
POLONIUM-218	3 MINUTES
LEAD-214	26.8 MINUTES
BISMUTH-214	20 MINUTES
POLONIUM-214	0.164 MICROSECONDS
LEAD-210	22.3 YEARS
BISMUTH-210	5 DAYS
POLONIUM-210	138 DAYS
LEAD-206	STABLE



RADIOACTIVE BESTIARY AND GARDEN

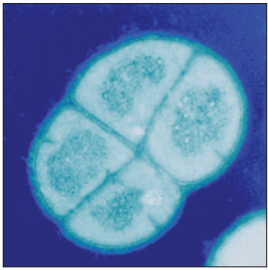
SPIDER-MAN: high school student Peter Parker who gains superhuman strength, bullet-dodging dexterity, and the ability to cling to any surface and to spin a web after being bitten by an irradiated spider.



GODZILLA: Japanese monster created by hydrogen bomb fallout.

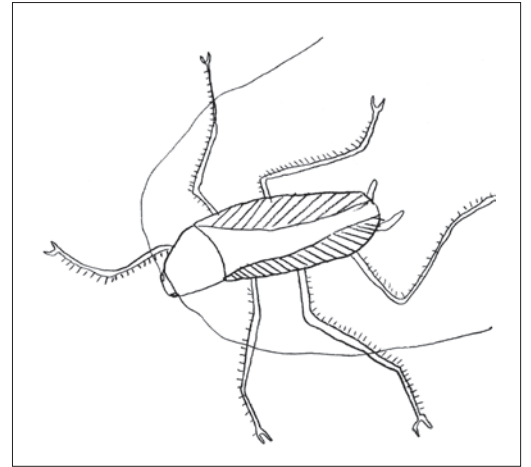
THE HULK: nuclear physicist Dr. Robert Bruce Banner transformed by gamma radiation from an underground nuclear test into a brutish green menace with phenomenal strength, the ability to breath underwater, and anger issues.

COCKROACH: mythologized as the lone survivor of a nuclear holocaust.



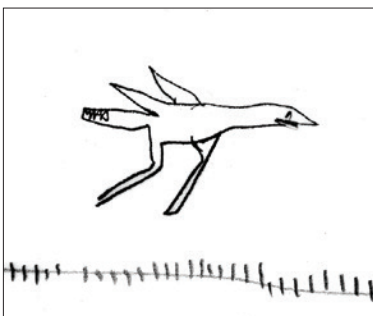
DEINOCOCCUS RADIODURANS ("Deinococcus": strange berry; and "radiodurans": resistant to radiation): bacterium discovered in Oregon in 1956 as a contaminant in cans of meat blasted by radiation. According to scientist Michael Daly of Uniformed Health Services in

Bethesda, Maryland, not cockroaches, as often cited, but this bacteria would be the last living organism to survive a nuclear catastrophe. His research on the astonishing resilience of Deinococcus may point to new ways to protect human beings from radiation exposure.



HORSE AND CARRIAGE THAT KILLS PIERRE CURIE:
(See page 97.)

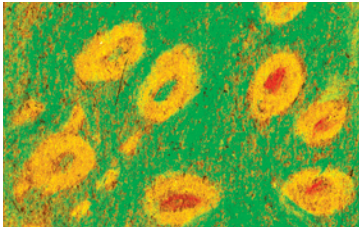
BERT THE TURTLE: anthropomorphic cartoon reptile from cold war *Duck and Cover* Civil Defense films.



ALBINO BARN SWALLOWS: birds adapting to radioactive contamination in Chernobyl's Zone of Alienation.
(See page 117.)

IVORY ELEPHANT: gift to Marie Curie from U.S. President Herbert Hoover, 1929. (See page 163.)





WATER BUTTERCUPS (*Ranunculus aquatilis*): flowers gathered by Pierre Curie, April 18, 1906, still fresh after his sudden death the following day. (See pages 94, 102.)

MUTANT FLOWERS: collected by Mary Osborn after the Three Mile Island nuclear plant accident, March 28, 1979, Harrisburg, Pennsylvania (See pages 102-103.)

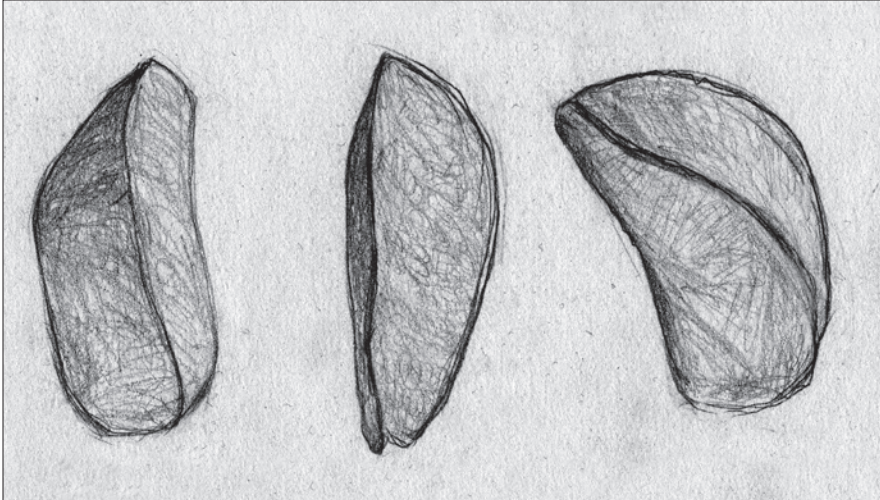
ZINNIA



ROSE



BRAZIL NUTS: world's most naturally radioactive food.



RADIUM BRAND FERTILIZER: "Radium Makes Things Grow" Brand Fertilizer [circa 1915-1920]. (See page 61.)

HIBAKU SEEDS: Seeds of trees affected by the 1945 bombing of Hiroshima. Artist Hiroshi Sunairi distributes hibaku seeds of various species to be replanted around the world.

クロガネモチ: ROUND LEAF HOLLY SEEDS



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