

First Place Winner: **As the Deer Bleat**

My name is Tu Youyou (too yo-yo). The name is an unusual one, an onomatopoeia dating back almost 3,000 years, to the time when Confucious walked the Earth and poured out his wisdom. It was he who compiled the **Book of Odes**, and in the book was written "The deer bleat 'youyou' as they eat the QingHao," from which my father chose my name.

As a child, I always thought it was a strange line to be named after. It seemed so random. Only years later would I realize how profound my name really was.

Who knew one strange name could save millions of lives?

I certainly didn't. And though I knew little about it at the time, as I grew, so did the conflict that would lead me to my discovery.

While I lay deathly ill, sweat soaking my bed covers, for two high school years as I battled tuberculosis, Vietnam was battling French colonial rule. As I began training at Beijing university, studying Chinese herbal medicine, the U.S. was training South Vietnamese to fight communist rule. By the time I graduated, the Vietnam War was in full swing.

But before we get to my involvement in the conflict, let's go back to 1967, to a hotel in Beijing. No one knows what happened in that hotel except that the most senior Chinese and Vietnamese officials walked into the hotel. And when they walked out, they had struck a deal. By Vietnamese request, the Chinese government instituted a national project; Project 523.

The goal was to find a cure to the new strand of malaria that was claiming thousands of Vietnamese lives during the war.

Under the government's command, hundreds of the best and brightest Chinese scientists were brought together in the seemingly impossible hope of curing this malaria once and for all. And I just happened to be one of those scientists.

In fact, because of my training in herbal medicine, I was chosen to head my division of the Project; the division of Traditional Medicine, which would test treatments from ancient Chinese dynasties' texts. I still

remember the pride I felt when it was announced that I, Tu Youyou, would head the division. I felt that my heart could burst with joy.

But participating in the project came at great, great personal sacrifice. My work took up so much of my day that I had to send my children away to boarding school. I didn't see them for three years. I was sent to Hainan, an area drenched in malarial mosquitoes, to study the disease at great risk to my own health. My team spent month after month scouring the country for any ancient text that might point us toward a potential treatment. And what results did we get for our effort?

Nothing. Absolutely nothing.

Every lead, each of the hundreds of ancient recipes that we tested led to a dead end. I was at my wits end, nothing had worked.

Nothing. We were no closer to a cure than when we had begun.

Until...

I sat down to examine the team's newest find; some 1,700 year old recipes entitled *Emergency Prescriptions Kept Up One's Sleeve* by GeHong, an ancient alchemist.

I scanned the documents. My eyes were tired from squinting at the small characters all day, but I forced my mind to focus. My eyes rested on a recipe that promised to cure intermittent fevers.

"*QingHao*, one bunch, take two sheng of water for soaking it, wring it out, take the juice, ingest it in its entirety."

I dropped the recipe, my eyes widening. Here was the answer we had been looking for. Here was the reason all our experiments had failed.

It was the water.

I ran to my colleague, my eyes ablaze with the only flicker of hope I had felt in months.

"Try the experiment with QingHao again," I ordered. "But this time don't extract it with boiling water; extract it with cold water."

My colleague looked at me skeptically; we had

already tried QingHao, and it hadn't worked. But he didn't protest.

Now, to my reader this may seem like a miniscule, unimportant detail. Why did it even matter if I was trying to extract medicine using hot or cold water?

I didn't know it at the time, but when I tried to boil QingHao, the active, malaria-fighting chemical was damaged by the hot water.

And sure enough, when we used the cold water to extract QingHao essence, it worked. Really, really well.

Well, at least it worked really well on mice.

It was time to begin human trials.

And as the leader of my division, I felt it my duty to be the first human test subject.

As I drank the medicine, it's hard to describe what I felt. I was so hopeful, yet... so afraid. Not for myself; I had already given up my life for this medicine. I was afraid of failure. That after all this medicine it would do nothing. That the people of Vietnam would continue to die, and that my treatment would be incapable of stopping it.

When I swallowed down the last gulp of medicine, I closed my eyes, just for a second, and let the breath enter and exit my nostrils.

After a few days, when it was confirmed that the medicine was safe, our team began experiments on 21 other patients. The QingHao medicine was completely effective in curing their malaria.

Now, QingHao medicine is used to save millions of lives across the globe.

"The deer bleat 'youyou' as they eat the QingHao," read the line of the Book of Odes after which I was named. How on Earth could my father have known that QingHao, the plant mentioned in this obscure line in an obscure poem after which I was named, would link my entire life to my destiny; a destiny that would cure malaria, save millions of lives and create the first Chinese woman to win a Nobel Prize.

—Anna Joy Dillon, age 16, Oregon.

Second Place Winner: **Rosalind Franklin**

"Rosy was bad-tempered, uncooperative, incompetent, and unattractive. Or rather, she chose to be by her unfeminine style of dress. She could not even interpret her own data." —The Double Helix.

In 1968, renowned scientist James Watson published his book "The Double Helix." It followed Watson and his friend Francis Crick, in their discovery of the structure of DNA. Rosalind Franklin, dubbed "Rosy," was one character in the book. In short, her role was to hold the rest of them back.

James Watson was lying.

In the 1940s and 1950s, the race was on to discover the secret of life. Recent scientific advances had made it clear that deoxyribonucleic acid, or DNA, gave all living things the instructions for life. This made DNA a hot topic.

One key player in this game was Rosalind Franklin, a brilliant young British-Jewish chemist and X-ray crystallographer. She would prove crucial to the discovery of the double helix.

Rosalind Franklin had always been intelligent, focused, and determined. As a young girl, she showed great talent for math and science. In fact, by the age of 15, she decided that she wanted to be a scientist.

Franklin won a scholarship to Newnham College, then one of Cambridge's two female colleges. She studied physics and chemistry. After graduating, she was awarded a graduate research scholarship. However, she did not get along well with her supervisor, R.G.W. Norrish, in part because of her position as a woman. Franklin eventually became an assistant researcher at the British Coal Utilization Research Association, studying the properties of coal and other hydrocarbons. Her contributions aided the war effort—her research would lead to better gas masks, and she also volunteered as an air raid warden—and her work earned her her Ph.D.

In 1946, Franklin moved to Paris, France, where she learned X-ray crystallography. This was a delicate process that involved using X-ray diffraction to determine the atomic structure of a crystalline solid. Though living frugally, she thrived there, enjoying the French people and culture as well as academic freedom. She continued her research on carbons and became a specialist in the field and an expert in X-ray crystallography.

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March is Women's History Month in the United States!

=> => Four years later, Franklin returned to England, beginning work as a research fellow in the Biophysical Laboratory at King's College, London. This time she would study the enigma of DNA. Tensions immediately rose. She got off on the wrong foot with fellow DNA researcher, Maurice Wilkins, because of miscommunication with the lab director.

While Franklin believed she was to work independently, Wilkins thought she was his assistant, creating conflict between the two scientists. Paired with contrasting personalities, it was the start of a relationship of mutual dislike. Additionally, the deep-seeded 'boys club' culture—of segregation and misogyny—that existed in the academic environment made it all the more difficult for a female scientist to succeed.

Despite the problems Franklin faced, she jumped steadfastly into her work. She worked for hours on end, using X-ray crystallography to capture photographs of crystallized DNA fibers. She discovered two forms of DNA—the dry A form and wet B form. In May of 1952, she captured the now-famous "Photo 51."

Photo 51 was the sharpest photo yet of B-DNA. It was incredibly clear and offered crucial clues towards the structure of DNA. Without Franklin's permission or knowledge, Wilkins showed the photo to James Watson and Francis Crick, two scientists working in the Cavendish Laboratory at Cambridge, who were also seeking the secret of DNA. This gave them the information they needed to confirm the double helix structure DNA.

Watson and Crick published a paper on the structure of DNA in the 1953 issue of *Nature*, announcing to the world that they had cracked the code. Although Franklin published a paper on her own research, it was placed after theirs, suggesting that her findings only supported Watson and Crick's. Little did she know that she had laid the foundation for their success.

Franklin did not appear to be upset about her lack of recognition and later even became friendly with the two men. She had left King's College a few months before the *Nature* publication, and went on to conduct pioneering research on viruses.

Tragically, Franklin was diagnosed with ovarian cancer in 1956. Not two years later, she passed away

from the condition. She donated the majority of her inherited money to charity. After her death, James Watson, Frances Crick, and Maurice Wilkins would receive the Nobel Prize for their discovery of the structure of DNA in 1962.

As mentioned earlier, Watson referred to her in his 1968 book as "Rosy" (*a name she was decidedly against!*) and created an unflattering and inaccurate caricature of her as a hysterical woman rather than the exceptional scientist that she was. Although in its epilogue he acknowledged her achievements and admitted to flawed first impressions, Watson still caused lasting damage to her legacy.

The Nobel Prize awarded to Watson, Crick, and Wilkins raises the question of whether or not Franklin would have been included in this group, had she been alive. However, in spite of her namelessness in this discovery, it is gratifying to note that Aaron Klug, a biophysicist and chemist who worked with Franklin, acknowledged Franklin in his own Nobel Prize speech.

Rosalind Franklin's experiences exemplify the failed recognition, dismissal, and blatant sexism that women in S.T.E.M. have faced for a long time. But still, she persevered.

Her tombstone reads, "*Her research and discoveries on viruses remain of lasting benefit to mankind.*" But we should remember Rosalind Franklin not only for her work on virus structures, but also for her critical role in the discovery of the double helix, her staunch determination in the face of sexism, her pioneering research in coal, and her brilliant mind and generous spirit.

—Lily Yao, age 15, Oregon.

The 2023 Asian Celebration Haiku Contest Invites your Nature Haiku or Tanka Entries by May 5th, 2023

Haiku and Tanka (*short song, in Japanese*) are traditional poetry forms that come from Japan. Use 8.5" x 11" paper to paint/draw your original nature art illustrating your poems. Chosen entries will be displayed at the 2023 Asian Celebration exhibit this summer. Your Haiku or Tanka entries should be ready for display. Select entries will be published in the Autumn 2023 issue and also on our website. *Send by email: info@SkippingStones.org; or by snail mail.*

Third Place Winner: **Elizabeth Cooking Greenleaf**

In 1727 C.E. Elizabeth G. Greenleaf opened her very own apothecary in Boston. She is known as the very first female pharmacist in America, and the ‘Mother of Pharmacy.’ She broke the glass ceiling forcefully thrust upon her, meant to stifle her growth and ignore her potential. She found a way to penetrate this gate-kept, male-only profession. Out of the 32 recognized apothecaries in New England, she was the only female owner in the 1700’s. Although Elizabeth died in 1762 C.E., it could be argued that she still lives on today, through the legacy she left behind, and in all of the female pharmacists of yesterday and today. She blazed her own path through life, and in doing so created a new set of footsteps women could follow in. I myself aspire to be a pharmacist, and to be able to walk the very road she forged.

Elizabeth single-handedly started the creation of what is today a thriving career path for women to succeed within, with about 56.8% of pharmacists being female as reported by “Zippia.” This is a staggering number when compared with the average percent of women in S.T.E.M. jobs being 28% according to *Bizwomen*. Additionally, according to “Narrow The Gap,” in 2021 pharmacists who were women made 4 cents more per dollar than male pharmacists. The career of pharmacist is undoubtedly and undeniably one of the most progressive career paths for women in terms of sheer numbers, and the gender wage gap in the S.T.E.M. field and beyond.

Additionally, Elizabeth carried, birthed, and raised 12 children while she simultaneously nurtured the embers of today’s bonfire of a career, known as pharmacy. Her husband lived away from her for a while working as the pastor of the Congregational Church in Yarmouth. After she initially opened her apothecary, her husband resigned from his job and moved out to Boston to help with their children and her apothecary. Actually, Elizabeth started out in her career as a pharmacist by preparing medications for her husband Daniel’s patients (he was also a physician). I’m sure that if her husband was not supportive of her ambitions, I myself, and many other women today would not have the golden opportunity to become a member of this thriving community of women in S.T.E.M. So, for that reason I am also grateful to Daniel Greenleaf (though

not to the same degree as Elizabeth).

Although Elizabeth Greenleaf was formally recognized and honored by the American Pharmacists Association for all of her hard work, for all of the contributions she has made to pharmacy (especially in regards to women) in 2012, her Wikipedia page is less than 200 words long. Her entire life’s story, all of her achievements and accomplishments were overwhelmingly summarized in a measly nine sentences! I can’t help but feel angry and a little betrayed on her behalf. She was instrumental to the wild success of an extremely important profession within not only the scientific community, but the healthcare community as well. And yet, no one would know the depth and the breadth of everything that was—and in some ways still is—*her* without a deep, rabbit-hole, research session. No one can claim that pharmacy is unwelcoming of women, but even important women in pharmacy seem to be unwelcome in the world at large.

—Ashlee L. Dana, age 17, Oregon.

Friend

I miss you
I love you
I hate you
This hurts
Your serrated words slice through my coffee skin, I grin
Afraid to lose you
I smile We talk
You lie We walk
Circles
again and again and again
Sequenced whispers penetrate hallways and homes
Back to square one
Alone and unknown
But with anything worth living for
You must sort out the weeds
Though not with ease
Always worth it in the end
I dream of you in oil paintings sometimes
Your raspberry curls dotted with time
So as we touch souls, after years, after months
I set my heart to rest.
You are my friend.

—Zoha Pattanaik, age 15, California.