



# The Bell Jars

Smith College, *Pelargonium sidoides*,  
and Sylvia Plath's Botanical Imagination

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**Abstract** Sylvia Plath's novel *The Bell Jar* chronicles prize-winning college student Esther Greenwood's descent into melancholy and attempted suicide. An emerging writer, Esther sees clearly the paths available to her under 1950s US patriarchy: homemaker or eccentric intellectual. Each on its own is untenable, and choosing one precludes the other. The bell jar metaphor conjures a sense of confinement and suffocation, but this essay offers a multispecies reading that shows why such an interpretation is too narrow. The essay looks carefully at the bell jar, its function within her story, and the context within which Plath encountered it, namely, as a student of botany at Smith College conducting lab exercises on photosynthesis using the South African silverleaf geranium (*Pelargonium sidoides*). Through archival research on Plath and botanical instruction at the college, the essay shows that the bell jars Plath used were not tools of oppression. Rather, they were tools for growing plants from far-away places that require higher atmospheric humidity: technologies for making dislocated life possible. Plath's cross-species encounters with exotic plants at the conservatory were critical to her conception of life as a woman under patriarchy—like the silverleaf geranium, living in a world not built for her.

**Keywords** Sylvia Plath, *The Bell Jar*, botany, interspecies encounter, glasshouses

Sylvia Plath's semi-autobiographical novel *The Bell Jar* chronicles prize-winning college student Esther Greenwood's descent into melancholy and attempted suicide. The patriarchy of the 1950s United States presented soul-crushing obstacles for women, including for those privileged by whiteness as Plath was. An emerging poet and author, Esther (along with Plath) sees clearly the paths available to her: homemaker or eccentric intellectual. She finds each path on its own untenable and unsatisfying, and choosing one precludes the other. Anyway, Esther wonders, why must she be forced to choose? The novel became rightly acclaimed for its vivid rendering of mental illness and the limitations placed upon women's lives (then and still today). It was published just a month before Plath's own suicide.

Critical interpretation of the novel envisions the bell jar metaphor as expressing a sense of confinement, suffocation, and death.<sup>1</sup> I argue below that this reading is too narrow, and I do that by posing some basic questions: What is a bell jar, and what are they used for? How did Plath arrive at this metaphor in the first place? A bell jar, I show, is a botanical device, and one that Plath used during a year-long general botany course in her first year at Smith College. Specifically, she used one in a lab exercise that demonstrated gas exchange and the manufacture of carbohydrates during photosynthesis. The plant underneath the bell jar was a cultivar of the geranium *Pelargonium sidoides*, an aromatic, arid-adapted plant native to South Africa. This botanical context is significant to our reading of her novel, our assessment of Plath, and more broadly our understanding of late modernism's relationship to nonhuman life. Looking closely at bell jars and Plath's encounter with them through archival research and interviews with staff at Smith's Lyman Conservatory, I show that Plath envisioned bell jars as sites of contingent productivity characterized by alienation and dislocation.

Her experience with bell jars points to a much longer history of use—as a botanical technology and as a metaphor. Bell jars were the earliest precursors to glasshouses dedicated to growing plants from other parts of the world—especially from places with higher atmospheric humidity. Plant physiologists no longer use them to measure transpiration, as newer and much more accurate measuring tools now exist. Yet, bell jars are still in use, including at Smith College, to help plants with high humidity requirements grow from seedlings or cuttings into viable, mature plants for transplanting. In short, bell jars are not tools for oppression and suffocation so much as they are tools for making dislocated life possible.

Plath's use of the glass bell jar as a trope was also part of a longer literary tradition. In exploring the significance of this moment of intimate cross-species encounter<sup>2</sup> between her and a geranium under a bell jar, she carried forward a tradition in which glass technologies for exotic plant horticulture were recognized by poets and novelists as sites of alienation. Glasshouses were evoked by Charles Baudelaire, Émile Zola, and others as bourgeois sites that spoke to social disorientation in late nineteenth-century Paris. Walter Benjamin would follow suit, too, when he scrutinized the Paris Arcades for their cultural and political content. The Arcades' architectural aesthetic was inspired by the glasshouse, illustrating for Benjamin how these sites of fantasy consumer capitalism housed not only alienated commodities but alienated modern subjects. The arcade, the glasshouse, and their prototype the bell jar have each served as technologies for making dislocated life possible, as well as figures for interpreting it.

1. Clark, *Red Comet*, 508–9, 653; Brain, *Other Sylvia Plath*, 6.

2. On the intimacy of more-than-human worlds, see Haraway, *When Species Meet*.

### The Bell Jar

Plath's novel opens with Esther Greenwood, the narrator and main character, feeling disoriented. The summer air was so humid that it felt "sultry" and "tropical."<sup>3</sup> Having won a prestigious national prize to intern at *Ladies' Day* magazine in New York City, she should be enjoying herself. Instead, she feels only malaise as she observes other prize-winners and considers the limited opportunities available to them.

Author and character are never far apart.<sup>4</sup> Even small details from the book track with Plath's recorded life. Plath won a national competition to intern as guest editor at *Mademoiselle* magazine in 1953. Greenwood is the anglicized version of Plath's mother's maiden name, Grünwald. Like Plath, Esther arrives at her New England college full of energy and dedication. She is an excellent student and becomes involved in countless activities, but she quickly finds herself in vexed positions with regard to men, and more broadly in regard to her life as a woman bursting with promise in a world that seemed to support her only to a point. The women Esther encounters at *Ladies' Day* are either destined for lives as housewives or eccentrics who sacrifice everything for their careers. Esther and Plath want both a family and a career, and they become frustrated that only men are able to contemplate that possibility. Esther's mother, like Plath's, is extremely capable and intellectual yet works as a typist and advises Esther to seek out such a skill. As for careers, the same for sexuality. Whereas women must protect themselves against pregnancy and sullied reputations, men are free to have affairs as they like. Spiraling into depression after three extremely successful years in college, Esther and Plath eventually attempt to end their lives.

Plath identified primarily as a poet, and her two collections *The Colossus* and the posthumous *Ariel* are unquestionably canonical. In the late 1950s and early 1960s, she became interested in novel writing. She explained this in an interview in 1962:

Now that I have attained, shall I say, a respectable age, and have had experiences, I feel much more interested in prose, in the novel. I feel that in a novel, for example, you can get in toothbrushes and all the paraphernalia that one finds in daily life, and I find this more difficult in poetry. Poetry, I feel, is a tyrannical discipline, you've got to go so far, so fast, in such a small space that you've just got to turn away all the peripherals. And I miss them! I'm a woman, I like my little *Lares* and *Penates*, I like trivia, and I find that in a

3. Plath, *Bell Jar*, 1, 17.

4. Debate swirls regarding how to approach the relationship between author and character in Plath's work, particularly given the vast amount of material in the "Plath archive" (Helle, "Introduction," 2), including drafts of published work, journals, letters, drawings, annotated books from Plath's personal library, and more. The erasures and omissions within that archive, Helle points out, combined with the lazy, often misogynist portrayals of Plath the person (see Brain, *Other Sylvia Plath*) pose challenges to all who write about her. In providing additional context to Plath's intellectual formation, I do not resolve those challenges. Neither do I have space to situate this argument in relation to all of Plath's literary output and Plath criticism. Instead, I point readers to recent work including Clark, *Red Comet*; Golden, *Annotating Modernism*; Brain, *Sylvia Plath in Context*; and Helle, Golden, and O'Brien, *Bloomsbury Handbook to Sylvia Plath*.

novel I can get more of life, perhaps not such intense life, but certainly more of life, and so I've become very interested in novel writing as a result.<sup>5</sup>

In 1963, just a month after *The Bell Jar* was published to good but mixed reviews, Plath took her own life in her London flat. Her husband had left her for another woman, and Plath was left to raise a toddler and an infant on her own, while also trying to write and earn a living. Her suicide took place in the kitchen. She gassed herself with an open oven after leaving milk and food out for her children. Her work treated many more topics than the oppression of women, but it was a theme that she treated with especial nuance and force. As the women's movement and second-wave feminism gained steam in the 1960s, Plath was taken rightly as an incisive theoretician of the condition of women. *The Bell Jar* in particular became a guide for exploring the darkness that was brought on by the stifling of ambition—especially for women in the United States who had recently been presented in a deeply empowered light as “Rosie the Riveter” factory workers, aiding the war effort while men were away fighting. Plath was extraordinary, visionary, and ambitious, and she was intent on living a full, important life.

In literary criticism and other discussions of the book, the trope of the bell jar has been taken to stand broadly for oppression and suffocation—as a kind of stifling but somewhat invisible apparatus that hangs over women. This interpretation is justified. The first mention of a bell jar in Plath's novel comes at a crucial point. Esther has recently attempted suicide by overdosing on sleeping pills, and she is being driven from the medical hospital where she was convalescing to a mental institution. There, she will be treated with electroshock therapy (also known as electroconvulsive therapy, or ECT). The driver is Philomena Guinea, a wealthy woman who was Esther's patron at college, helping to pay the expenses of tuition and now also her medical expenses. Esther understands that she should feel grateful to Mrs. Guinea, but she can't feel anything. Even if Mrs. Guinea bought her a trip around the world, she narrates, it wouldn't matter: “Wherever I sat—on the deck of a ship or at a street café in Paris or Bangkok—I would be sitting under the same glass bell jar, stewing in my own sour air.”<sup>6</sup> A bell jar hangs over the heads of other women, too, Esther reports, even ones that appear happy. Bell jars produce “stifling distortions,”<sup>7</sup> she says.

Consider, however, how Plath described the bell jar in her journals and letters. The first mention in Plath's journals comes in a July 11, 1952 entry, the summer after her second year at Smith and prior to her magazine internship. In the entry, she used the bell jar as a way to describe her intensely productive life at Smith, contrasted with the relaxing but empty condition of living outside the routines of school and work:

Life was not to be sitting in hot amorphous leisure in my backyard idly writing or not-writing, as the spirit moved me. It was, instead, running madly, in a crowded schedule,

5. Plath, “Sylvia Plath,” 171.

6. Plath, *Bell Jar*, 185.

7. Plath, *Bell Jar*, 241.

in a squirrel cage of busy people. Working, living, dancing, dreaming, talking, kissing—singing, laughing, learning. The responsibility, the awful responsibility of managing (profitably) 12 hours a day for 10 weeks is rather overwhelming when there is nothing, noone [sic], to insert an exact routine into the large unfenced acres of time—which is so easy to let drift by in soporific idling and luxurious relaxing. It is like lifting a bell jar off a securely clockwork-like functioning community, and seeing all the little busy people stop, gasp, blow up and float in the inrush,<sup>8</sup> (or rather outrush,) of the rarified scheduled atmosphere—poor little frightened people, flailing impotent arms in the aimless air. That’s what it feels like: getting shed of a routine. Even though one has rebelled terribly against it, even then, one feels uncomfortable when jounced out of the repetitive rut. And so with me. What to do? Where to turn? What ties, what roots? as [sic] I hang suspended in the strange thin air of back-home?<sup>9</sup>

In this image, the bell jar hangs over productive and routinized activity—not simply work and school but also dancing, dreaming, talking, kissing, and so on. Life outside of the bell jar is free from that pressure but also removed from the thrill of life. Plath is ambivalent. She is clearly critical of the demanding lifestyle, yet she derives pleasure and satisfaction from it and has a distaste for “amorphic leisure” and the “thin air” back home. “Life was not to be” amorphic.

Just over a week later, Plath makes the first recorded mention of bell jars in a letter to her friend and former college roommate, Marcia Stern. She says:

It’s quite amazing how I’ve gone around for most of my life as in the rarified atmosphere under a bell jar all according to a schedule—four college years neatly quartered out in seasons with summers to be filled in at will, hopefully, profitably, and never more than 2 or 3 weeks free at one time to worry about what comes next in. Even now, although the top would seem to have suddenly blown off, I know if I keep moving, time will pass, being as time is but an emptying of wastebaskets, a deadly going out and in of doors, a brushing of teeth routinely and a marking off of spaces until the cycle comes round again, and I will be gaily drunkenly academic again. God! After a year of dying for summer sun, I long only too soon to be myself (whatever that is) again.<sup>10</sup>

Here again, life outside the bell jar is “but an emptying of wastebaskets.” She longs to be truly herself “(whatever that is)” under the bell jar, in spite of its difficulties. It’s not that life under the bell jar is “good,” of course. That much is clear in the novel. It’s complicated. It may be oppressive, with “stifling distortions,” pressures, and routines; but it can also be gay and drunken, with growth and life and joy. Later in this essay, I will

8. Plath returns to this image of “inrushing” air when Esther goes on a skiing vacation in the Adirondacks. The man she’s expected to marry, Buddy Willard, has just proposed to her, and the thought of suicide “formed in [her] mind as coolly as a tree or flower”—she feels her “lungs inflate with the inrush of scenery” (Plath, *Bell Jar*, 97). As though attempting to take her life, she then speeds recklessly downhill and crashes, suffering a broken leg.

9. Plath, *Unabridged Journals*, 118.

10. Plath, *Letters*, 471–72.



Figure 1. Bell jars in use at Lyman Conservatory, Smith College, 2022. Photograph by the author.

examine how this trope shifted from ambivalence toward a more definitively negative register in Plath's novel. For now, it's useful to consider what a bell jar is and does—and the context in which Plath encountered it.

### **Bell Jars in Horticulture and Literature**

A bell jar is a bell-shaped glass container, typically around 35–75 cm tall with an open bottom and sometimes featuring a small hole at the top that can be closed with a plug. They are used by horticulturists to grow out cuttings of plants that require much higher humidity than is found in the local atmosphere. Underneath the bell jar, the transpiring plant will begin fogging up the glass, and eventually moisture will accumulate and stream down the sides.

Bell jars were prototypes for greenhouses, in fact. As early as the sixteenth century in Italy, gardeners used glass bells, which they placed over plants to protect them from direct sunlight and to regulate temperature.<sup>11</sup> This principle was later scaled up into glasshouses (greenhouses) so that non-native medicinal plants could be grown. This innovation was embraced further north for the purpose of growing citrus plants, in

11. Desmarais, *Monsters under Glass*, 15–16.

what came to be known as “orangeries.” As glass became more widely available in the seventeenth and eighteenth centuries, these became increasingly common. The nineteenth century was the golden age of “hothouses,” glasshouses that also featured steam or other forms of heating. These houses were elaborated over time to such an extent that they took the shape of grand and spectacular architectural marvels, including the Crystal Palace in Staffordshire, built in 1853–54.

Converging with this technological development was Europe’s colonial endeavors: its voyeurism and exoticism, coupled with its material plunder of colonized lands. Botanic gardens and their glasshouses were important tools of colonial empire.<sup>12</sup> With them, colonial governments worked to catalog plants and establish the primacy of Western plant knowledge, to display exotica to a public eager to be presented with oddities from far-off lands that might confirm colonial prejudices about colonized peoples, and to secure valuable pharmacopeias and cash crops such as quinine or coffee. These architectural structures came to embody a Victorian worldliness, transporting the middle and upper classes of temperate Europe to the tropical landscapes they heard about and benefited from. On top of it all, the late nineteenth century’s fascination with natural history accelerated this process of keeping and displaying exotic plants. Alexander von Humboldt’s writings on plant geography were widely read across Europe, for example. “Orchid fever” hit Britain, and ever grander plant-collecting expeditions were undertaken especially by the British to document and study plant diversity.

From the mid-nineteenth century onward, the cultivation of exotic plants would become widely practiced.<sup>13</sup> Sometimes referred to as *cloches de verre* in French, bell jars were taken up widely for scientific and horticultural practice by professionals and in the home alongside other glass technologies such as vivariums, aquariums, and Wardian cases. This helps explain why European writers—particularly those critical of bourgeois modernity and its alienating tendencies—looked to glasshouses when seeking to interpret their own condition. The late nineteenth-century poets and novelists Charles Baudelaire, Émile Zola, Joris-Karl Huysmans, and others deployed glasshouses as metaphors for the oppressive confinement and estrangement of modern, urban life, recounting them as sites of mystery, eroticism, displacement, and disorientation.

Walter Benjamin took Baudelaire’s work as a point of departure, drawing attention to the ways that the architectural forms of glasshouses were applied to the construction of the Paris Arcades.<sup>14</sup> The Arcades’ design was inspired by the innovation and drama of iron and glass at England’s Crystal Palace, aiming to dazzle Parisian consumers not with exotic plants but with another dislocated form: the commodity. Like the plants on display in glasshouses, these commodities tantalized the consumer and pointed to fantasy worlds that appeared profoundly avant-garde though they recycled aesthetic forms

12. Brockway, “Science and Colonial Expansion.”

13. Darby, “Un Natural History”; Desmarais, *Monsters under Glass*, 30–31.

14. Benjamin, *Arcades Project*; Buck-Morss, *Dialectics of Seeing*.

from earlier periods, even to antiquity. Benjamin envisioned an isomorphism between alienated commodities and alienated modern subjects, such as flaneurs, who stroll through the Arcades in inclement weather because the street is their world.

Plath would not have read *The Arcades Project*, but she was deeply familiar with Baudelaire, Zola, and Huysmans, as is evident from her library collection at the Smith College Special Collections, which includes Baudelaire's *Les Fleurs du mal* (*Flowers of Evil*) and her heavily annotated copy of Edmund Wilson's *Axel's Castle*, which discusses these works.<sup>15</sup> She called forward this literary legacy when she wrote *The Bell Jar*, whether as deliberate invocation or implicit reference. Like these authors who influenced her, Plath wrote and lectured against "death-in-life" or the paralysis that stems from modern, especially urban life, as experienced by Esther.<sup>16</sup> Relatedly, Plath valued encounters with "the real"—with things in themselves, unmediated. Consider, for example, her interest in ordinary household objects like toothbrushes referenced above. Or how, at a dinner party in London just two days before her death, she met a painter and expressed disappointment when she learned that he painted abstracts: "What a pity. If I could paint, I would want to paint things. I love the thinginess of things."<sup>17</sup> This concern is partly perhaps why she gravitated toward the Victorian poet Gerard Manley Hopkins,<sup>18</sup> who also aspired to the real, albeit through his own metaphysical Christian longing. For example, Plath was very good at drawing and saw it as important to her literary work. Commenting on some drawings she had made in a letter from Cambridge to her husband, she says, "It is as if, by concentrating on the 'in-scape,' as Hopkins says, of leaf and plant and animal, I can know the world a new and special way; and make up my own versions of it."<sup>19</sup> Here, Plath is referring to Hopkins's concept of "inscape," a neologism to capture a thing's unique essence. Plath also references "the selfhood of things" in a journal entry from October 22, 1959, reflecting on visits to a nearby greenhouse during her writing fellowship at the Yaddo Estate in upstate New York: "Drew a surgical picture of the greenhouse stove yesterday and a few flowerpots. An amazing consolation. Must get more intimate with it, [sic] That greenhouse is a mine of subjects. Watering cans, gourds and squashes and pumpkins. Be-headed cabbages inverted from the rafters, wormy purple outer leaves. Tools: rakes, hoes, brooms, shovels. The superb identity, selfhood of things."<sup>20</sup> Her observations echo those she made at another glasshouse—Smith College's Lyman Conservatory—as I show in the next section.

15. See Golden, *Annotating Modernism*.

16. Golden, *Annotating Modernism*, 51.

17. Clark, *Red Comet*, 890.

18. Plath admired Theodore Roethke's poetry, which also sought to understand the inner self through encounters with things in nature, especially those found in greenhouses. I thank Amanda Golden for pointing this out to me.

19. Plath and Hughes, *Sylvia Plath*, 3.

20. Plath, *Unabridged Journals*, 520.



**Botany 11: General Botany**

Esther narrates in *The Bell Jar*:

At college I had to take a required course in physics and chemistry. I had already taken a course in botany and done very well. I never answered one test question wrong the whole year, and for a while I toyed with the idea of being a botanist and studying the wild grasses in Africa or the South American rain forests, because you can win big grants to study offbeat things like that in queer areas much more easily than winning grants to study art in Italy or English in England; there's not so much competition.

Botany was fine, because I loved cutting up leaves and putting them under the microscope and drawing diagrams of bread mold and the odd, heart-shaped leaf in the sex cycle of the fern, it seemed so real to me.<sup>21</sup>

This passage brings the reader into contact with several aspects of Esther and Plath's identity and interests. First, we see their intense ambition and awareness of the architecture of academic life, including where awards are located and how they can be obtained. They sense that there are opportunities in the field of botany. Second, however, we learn that botany is more than a passing interest. Not only did they perform flawlessly in the course, but it nearly pulled them away from literature into a career of far-flung field research. Third, we are put in touch with the settler fantasies that shaped white US American life then as now, and which are clearly built into that architecture of academic production. Studying "wild grasses in Africa" is not only evocative but also plausible and grant-worthy partly because it is seen as exotic. Finally, and most significantly, we are brought into her encounters with plants and their specificities. "It seemed so real to me." They may have been foreign life forms, and part of foreign academic terrain, but they were real and alive and present there in front of her. "I loved cutting up leaves and putting them under the microscope." Her father Otto was a zoology professor at Boston University studying bees—interested in botany and an avid gardener—and Plath's poetry, letters, and journals demonstrate a sustained interest in plants and pollination, including her famous bee poems at the end of *Ariel*. In *The Bell Jar*, Esther puts botany in contrast to physics immediately after the above passage. "The day I went into physics class it was death." Esther (and Plath) also received an A in physics. But in physics, Esther explains, very real things such as balls rolling down a ramp were converted into "letters and numbers and equals signs all over the blackboard and my mind went dead."<sup>22</sup>

Plath's academic transcript shows that she took the course Botany 11: General Botany in her first year, a year-long lecture and lab course. It served to meet the general science distribution requirement in place for students at that time, and was a prerequisite for upper-level courses in botany. Bell jars were used at the time to measure

21. Plath, *Bell Jar*, 34.

22. Plath, *Bell Jar*, 34.



Figure 2. Plant Physiology Lab, featuring a Wardian case (right), Ganong (left), and students using bell jars and other botanical apparatuses, Smith College, ca. 1904. Photograph by Katherine Elizabeth McClellan. CA-MS-00104, Buildings Records, College Archives, Smith College Special Collections.

transpiration and were commonly seen around Lyman Conservatory. Archival photographs from the turn of the century and onward feature numerous bell jars on working tables or on shelves (see fig. 2) as students and faculty conduct research. These bell jars continue to be used at Lyman—almost certainly the same jars used by Plath. They aid horticulturists in growing out cuttings or seedlings that require especially high humidity, such as aroids and begonias, until the plants can survive in the reduced humidity of one of the conservatory’s various rooms (or “Houses”).

I have noted that bell jars have been used in greenhouse horticulture for centuries. But their use underwent a significant development as a plant physiology technology at Smith College. The first head of Smith’s botany department was William F. Ganong, who arrived in 1894. Ganong maintained research and teaching interests in plant physiology, and he led the construction of Lyman’s Physiology House for lab research on the subject (see fig. 2). He was a leading botanist in his day, at one point serving as the president of the Botanical Society of America,<sup>23</sup> and he was especially influential in the areas

23. Sundberg, “Botanical Society Builds the Discipline.”

of botanical pedagogy, having written pedagogical texts for instructors at the college level<sup>24</sup> and several widely used textbooks for college instruction,<sup>25</sup> including a laboratory textbook for plant physiology.<sup>26</sup>

Not only that, Ganong was a major figure in the development of apparatuses for plant physiology measurements, including through a collaboration with Bausch & Lomb Optical Company. In several sales brochures for Bausch & Lomb, previously released as a series of brief articles in the journal *Botanical Gazette* between 1904 and 1909,<sup>27</sup> Ganong describes these various devices and how to use them. Detailed hand drawings accompany the text.<sup>28</sup> Ganong established Smith College's reputation as a leading site of physiology-focused laboratory education in botany.<sup>29</sup>

These apparatuses included bell jars and associated tools. One is a "Bell Jar Support," which enables measurements such as transpiration, or the loss of water as vapor through leaf tissue pores called stomata:

For several purposes of plant physiology it is necessary to insert into a closed bell-jar through which air may be drawn, the stem and leaves of a plant whose roots or lower part must remain attached but outside. Thus the gases supplied to and released by a plant may be regulated or analyzed, and thus also, by drawing wet or dry, cold or warm air, etc., through the chamber, may the external conditions be altered one at a time, as is needful for example, for the best results with potometers.<sup>30</sup>

The image that accompanies that text depicts an unidentified plant underneath the bell glass. At the base of the jar, the insignia "B&L O. Co." appears on the iron stand. This plant appears to have been cut, but elsewhere Ganong describes how to seal off the soil and root system of a potted plant from the aboveground vegetation. Two half-circle glass plates meet at the center, where a 1 cm hole exists for the stem to pass through. Split rubber tubing and stop wax are used to fill the rest of the hole. The catalog notes that sometimes these plates can push open, and the operator might need recourse to a wooden wedge: "If the halves of the plate tend to spread apart they may be kept together by a small wooden wedge (shown in the illustration) forced down between one of them and the iron ring."<sup>31</sup> The image and description are somewhat haunting in their cold scientism, recounting how the apparatus can be reinforced when failing to conform to the demands of total atmospheric isolation.

24. Ganong, *Teaching Botanist*.

25. Ganong, *Living Plant*; Ganong, *Textbook of Botany for Colleges*.

26. Ganong, *Laboratory Course in Plant Physiology*.

27. The first of five was Ganong, "New Precision-Appliances for Use in Plant Physiology."

28. I came to this research project after flipping through this catalog while I happened to be reading *The Bell Jar*.

29. Sundberg, "Botanical Education in the United States," 32.

30. Bausch & Lomb Optical Co., *Ganong Botanical Apparatus*, 36.

31. Bausch & Lomb Optical Co., *Ganong Botanical Apparatus*, 36.

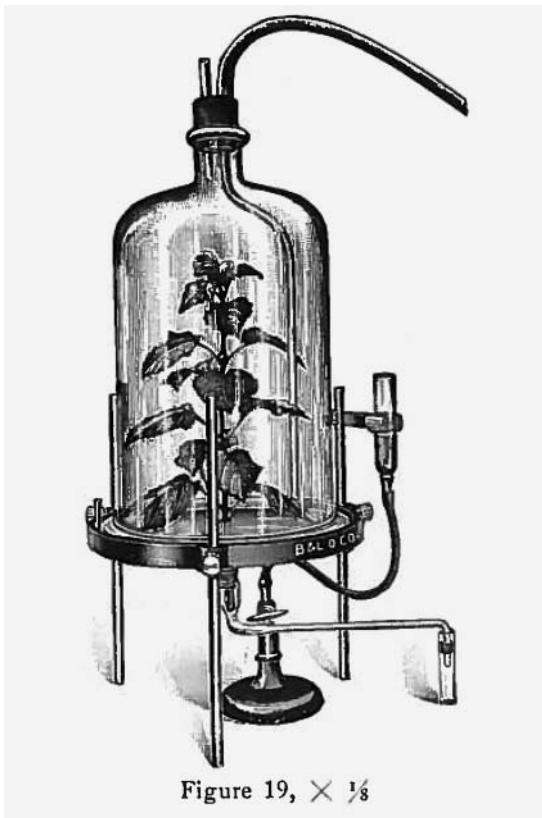


Figure 3. "Bell Jar Support," featured in the Ganong Botanical Apparatus catalog (Bausch & Lomb Optical Company, 1914).

Yet behind that scientism lay a fascination with and love for plants. As Ganong would argue in his book *The Teaching Botanist*, educators should show students that above all a plant is "a living, breathing, working being, with its functions controlling its structure."<sup>32</sup> As the historian and biologist Marshall Sundberg explains, Ganong envisioned education as being student-led and open-ended: "Everything in the laboratory should be presented in the form of a problem, just beyond the students' current understanding, but arranged so that the students could find their own answers."<sup>33</sup> Given that Ganong taught for thirty-four years at Smith, and given his prominence in botanical pedagogy, it is likely that his approach lived on at Smith long after his departure in 1932.

Kenneth Wright, the botany department's plant physiologist during Plath's time at Smith College, maintained Ganong's ideals. Wright set out his teaching philosophy in an article called "The Teleological Approach to Botany,"<sup>34</sup> published in 1948 in the *American Biology Teacher*. Too often, he says, people seek to provide the answer why as opposed to focusing on how something happens. They rush to explain the meaning of something before attempting to describe it. We can assume this represented an important pedagogical statement for Wright based on where it was published, and that this line of thinking

32. Ganong, *Teaching Botanist*, 4.

33. Sundberg, "Botanical Society Builds the Discipline," 34.

34. Wright, "Teleological Approach to Botany."

was current for him when Plath arrived just two years later. Wright also happened to be the instructor of Plath's botany course and her pre-major adviser,<sup>35</sup> and she writes of him with fondness.<sup>36</sup> Emphasizing the importance of pausing, characterizing, and describing rather than generalizing, Wright may have been influential in showing the humanist Plath how the careful observation and description of plants might inform her understanding of the human condition.

### Manufacture of Carbohydrates

By the time she arrived at Smith, it had become clear that bell jars were incapable of providing sufficiently accurate measurements for botanical science. In 1949, R. Burris and cowriters explained in the *Botanical Gazette* why these devices were unsuitable to controlled measurement: "A favorite with many, the bell jar covering a potted plant . . . is not recommended because of the difficulty of maintaining a good seal. Even though the pot is placed in a saucer, soil frequently gets onto the ground-glass surface of the bell jar or the ground-glass bottom plate. Transpired water also collects at the bottom seal."<sup>37</sup> Nevertheless, they continued to be used in student lab exercises, where exact precision was not needed.

Plath took Botany 11 in her first year of college (1950–51). Students met once per week for a lecture and twice per week for their lab exercise. The textbook they used was not Ganong's<sup>38</sup> but rather the recently published *College Botany*, authored by Harry Fuller and Oswald Tippo.<sup>39</sup> The textbook de-emphasized physiology slightly when compared to Ganong's, which was deeply concerned with the structure and function of plants. Ganong's chapters, for example, were titled "The Morphology and Physiology of Leaves," "The Morphology and Physiology of Stems," and so on for roots, flowers, fruits, and seeds. Nevertheless, physiology was still central to Plath's course. Wright, her primary instructor, was a plant physiologist with an active physiology research program. During Plath's course, he was working with a teaching fellow, Nancy Barton, on a project that used "high humidity chambers" (bell jars) to measure "the effects of transpiration upon the absorption and translocation of radioactive phosphorous,"<sup>40</sup> research that was published in the journal *Plant Physiology*. Botany 11 was cotaught with Sara Bache-Wiig, a mycologist. Bell jars were also used in experimental mycology from the 1860s to at least the 1960s,<sup>41</sup> so it is entirely possible that Bache-Wiig was also employing bell jars in her own research and teaching—including the horticulture of bread mold that would feature in Plath's lab exercises later in the year. In sum, bell jars would have been widespread at Lyman Conservatory at the time.

35. Plath, *Unabridged Journals*, 678n.

36. Plath, *Letters*, 174–75.

37. Burris, Wilson, and Stutz, "Incorporation of Isotopic Carbon," 66.

38. Ganong, *Textbook of Botany for Colleges*.

39. Fuller and Tippo, *College Botany*.

40. Wright and Barton, "Transpiration and the Absorption and Distribution," 386.

41. For example, see Ainsworth, *Introduction to the History of Mycology*, 30.

One of the earliest lab exercises—the fourth of fifty-six—took place in the second week of Plath's time at Smith. Corresponding to a unit on photosynthesis and transpiration, this exercise was titled "Manufacture of Carbohydrates." It sought to inform students about gas exchange in the course of food production during photosynthesis. The lab outline shows that it included five different experiments: (1) Study of Chlorophyll; (2) Relation of Chlorophyll to Photosynthesis; (3) Relation of Light to Photosynthesis; (4) Relation of Carbon Dioxide to Photosynthesis; and (5) Gas Release in Photosynthesis. The plant used in most of the experiments is the "silverleaf geranium," the common name for *Pelargonium sidoides* and its cultivars. The fourth experiment instructs students,

Under each of two bell jars place a geranium plant. Insert at top of each jar a funnel and in one place powdered brick and in the other soda lime. Likewise under each jar place a beaker of powdered [sic] brick and a beaker of soda lime respectively. Soda lime removes carbon dioxide from the air; brick leaves the air unchanged. After several days remove some leaves from each plant. . . . Result? Complete the drawings of the apparatus as set up. Make suitable written records.

The plants subject to soda lime treatment would have fared poorly, being starved of the carbon dioxide they need for photosynthesis. In effect, Plath was taught to see how plants breathed and sustained themselves through her use of the bell jars at Lyman Conservatory—to understand what atmosphere meant and to comprehend the conditions for life of this radically other life-form. In *The Bell Jar*, Esther describes being moved by the language of botany, the form of plants, and by their mechanism of transpiration. She is excited by "leaf shapes and enlarged diagrams of the holes the leaves breathe through and fascinating words like carotene and xanthophyll on the blackboard."<sup>42</sup> Indeed, Plath was asked in the first week of Botany 11 to diagram the stomata of a leaf. Because Plath was very talented at drawing, she would have taken this activity seriously, noting the specific shape and character of her subjects. The same would have been true in the experiment mentioned above, where she was asked to draw the bell jar. Esther describes being in her botany course: "Drawing diagrams of bread mold and the odd, heart-shaped leaf in the sex cycle of the fern, it seemed so real to me."<sup>43</sup> Units on these organisms came later in the year, when students were asked to diagram and dissect black bread mold (*Rhizopus nigricans*) and to draw the heart-shaped gametophyte generation (prothallus) of ferns. Images of both feature in her textbook.<sup>44</sup>

Consider also what she was asked to do for the second experiment on chlorophyll, "Relation of Chlorophyll to Photosynthesis":

42. Plath, *Bell Jar*, 35.

43. Plath, *Bell Jar*, 34.

44. Fuller and Tipppo, *College Botany*, 652, 788.

a. Examine leaves of the silver leaf geranium.

Draw a leaf, indicating the region in which chlorophyll is present.

Kill the leaf by placing it in boiling water, and remove the chlorophyll by placing it in a vial of alcohol in a water bath. Remove, wash in water, and test for starch by covering with iodine. What part of the leaf turns blue? What does this indicate? Draw the tested leaf, and write suitable notes.

Silverleaf geranium cultivars feature variegated leaves with white margins, and the rationale for this experiment is to leverage this variegation. Photosynthesis produces sugars that form starches (i.e., carbohydrates). Because iodine turns starches blue, the green part of the variegated leaf would turn blue. The whitened part, which has no chlorophyll and therefore does not photosynthesize, would not.

This was an intimate, interspecies encounter, a transformative moment of recognition in which the plant became materially real and also a figure for doing interpretive work.<sup>45</sup> The plant itself therefore matters to this story. Who was this plant that Plath engaged with, the silverleaf geranium?

### The Silverleaf Geranium

*Pelargonium* is the second largest genus in the geranium family, Geraniaceae. *P. sidoides* DC. can grow to 0.5 m in height and spread at maturity. It is a hardy plant from Southern Africa that is adapted to arid conditions but can also tolerate as much as 80 cm of annual rainfall provided that it grows in well-drained soil.<sup>46</sup> As a result, it has a wide distribution in habitats across South Africa and Lesotho, from sea level to high-elevation mountains, with soils that range from sandy to clay loam to basalt, in partial or full sun. It has a tuberous underground stem that grows deep in the soil, enabling it to tolerate drought, fire, and even an occasional frost.

The plant is widely used in medicine (especially traditional and homeopathic medicine) to treat respiratory infections, and it is the slow-growing tuber that is harvested. Many health food stores in the United States sell the product Umcka Cold Care, whose primary ingredient is *P. sidoides*. In South Africa, these products include the over-the-counter treatments Umckaloabo and Linctagon. It has been shown to feature several unique compounds and has been taken up by Western biomedical practitioners.<sup>47</sup>

45. Haraway, *When Species Meet*.

46. *P. sidoides* might seem an unlikely candidate for a lab exercise on transpiration, given that arid-adapted species with relatively small leaves might transpire at lower rates than others with larger leaf surfaces occurring in moist habitats. Indeed, some of the drawings in Ganong's publications show unidentified geranium species with much larger leaf surfaces (see Ganong, "New Precision-Appliances for Use in Plant Physiology," 1:305, 2:146) and others that resemble begonias or *Hibiscus* species (see Ganong, "New Precision-Appliances for Use in Plant Physiology," 3:212). However, as noted above, *P. sidoides* is not strictly a desert plant and takes up plenty of water. The plants used in lab exercises were also cultivars with strong variegation in the leaves, which may have been more robust.

47. Brendler and van Wyk, "Historical, Scientific, and Commercial Perspective."



Figure 4. *Pelargonium sidoides*, Lyman Conservatory, 2023. Photograph by the author.

The species is widely known in horticulture, too. Lily Carone is the lead horticulturist for the Show House at the Lyman Conservatory, where *Pelargoniums* are kept alongside other fragrant plants and succulents (many of which also come from Southern Africa). She explained to me that *P. sidoides* is a good conservatory plant in the sense that it produces attractive leaves, stems, and flowers. Volatile compounds in *Pelargonium* leaves mean that they are often very aromatic. The leaves are heart-shaped, gently wrinkled at the margins, and pubescent (see fig. 4). The flowers are born in terminal umbels, and they range in color from dark red to maroon to almost black in color, with the characteristic, five-petal *Pelargonium* morphology.

Since the mid-nineteenth century, after Robert Sweet's<sup>48</sup> five-volume *Geraniaceae* (1820–30) catalyzed interest in geranium cultivars, *P. sidoides* became well established as an ornamental plant in Britain for home gardeners and botanic gardens alike, where the cool but mild climate proved suitable. The Royal Horticultural Society has given it the Award of Garden Merit, affirming its value as a garden plant.<sup>49</sup> At the time that Plath

48. Sweet, *Geraniaceae*.

49. "Pelargonium sidoides," Royal Horticultural Society, <https://www.rhs.org.uk/plants/27782/pelargonium-sidoides/details> (accessed June 29, 2023).





Figure 5. Ganong (left) with students and *Pelargonium* plants in the Plant Physiology House, 1910. Bell jars covered in paper sit on a table on right. Photograph by Katherine Elizabeth McClellan. Buildings Records, College Archives, Smith College Special Collections.

was a student in Botany 11, geranium cultivars were still quite popular. Not only are they attractive, but many are quite easy to grow, being drought tolerant. The silverleaf geranium is exotic, then, yet also a common domestic plant. One early photo from 1911 shows Ganong alongside his students in the newly constructed Physiology House, built for his plant physiology research and teaching. In front of them sits a brick and concrete island that stands today, upon which are dozens of *Pelargonium* plants—perhaps hybrids they were developing to train students for work in the horticultural industry.

Plath makes no specific mention of *P. sidoides* in her published writings, but she does clearly know and have affection for geraniums, including before entering college where she describes painting her bicycle “geranium red.”<sup>50</sup> She references geraniums in the poems “Point Shirley,” “Leaving Early,” and “Mystic,” as well as in her letters and journals. In a letter to her mother on October 2, 1956, Plath says, “By the way, I’d love red geraniums around the front of our house! I always thought petunias straggly and messy, and geranium [sic] are so sturdy, and My Color!”<sup>51</sup> As noted above, Plath regularly visited a greenhouse during her residency at Yaddo Estate in 1959, which she observed, sketched, and wrote about. In an untitled, unpublished poem, she draws connections between

50. Clark, *Red Comet*, 76.

51. Plath, *Letters*, 1261.

the greenhouse and a mental hospital: “This shed’s fusty as a mummy’s stomach: / Old tools, handles and rusty tusks. / I am at home here among the dead heads. / Let me sit in a flowerpot, / The spiders won’t notice. / My heart is a stopped geranium.”<sup>52</sup> Compare this with her line from *The Bell Jar*, to which she would soon turn after finishing her collection of poems at Yaddo, *The Colossus*: “To the person in the bell jar, blank and stopped as a dead baby, the world itself is the bad dream.”<sup>53</sup> Or, consider the final lines of her late poem, “Mystic,”<sup>54</sup> with its echoes of plant transpiration: “Meaning leaks from the molecules. / The chimneys of the city breathe, the window sweats, / The children leap in their cots. / The sun blooms, it is a geranium. // The heart has not stopped.”

In this following section, I return to Plath’s novel. I hope to show that not only was this cross-species encounter in the plant house generative for Plath’s understanding of the condition of women under patriarchy but also that her attitude toward this world under the bell jar underwent a shift from ambivalence to abhorrence.

### **The Strain of Life underneath and outside the Bell Jar**

*The Bell Jar*, like much of Plath’s poetry, is rich in plant imagery—as it is rich in references to air and atmosphere. Consider the role of vegetation in Esther’s account of Jay Cee, the editor who supervises her during her time at *Ladies’ Day* magazine. Esther had recently begun to question her place in the world as she moved from life in school to life outside school, having been frustrated by the few paths available to her, and feeling like she was “slowing down” after “nineteen years of good marks and prizes and grants.”<sup>55</sup> Esther describes with trepidation having received a call from Jay Cee to come to her office: “When I made my wan entrance into the office at about ten o’clock, Jay Cee stood up and came round her desk to shut the door, and I sat in the swivel chair in front of my typewriter table facing her, and she sat in the swivel chair behind her desk facing me, with the window full of potted plants, shelf after shelf of them, springing up at her back like a tropical garden.”<sup>56</sup>

This display of exotic plants becomes the backdrop for her interactions with Jay Cee, a woman who had chosen a career life to the detriment of a family life. Both seated in swivel chairs behind desks, Jay Cee reflects a possible future back to Esther. She later wonders what it would be like to be called “Ee Gee, the famous editor, in an office full of potted rubber plants and African violets my secretary had to water each morning.”<sup>57</sup> Contrasting it with her own (implicitly mundane) upbringing, she says that she wishes her mother were like that—instead, her mother was a typist. When her mother became widowed, she taught shorthand and typing. She advises Esther to learn those practical

52. Plath, *Unabridged Journals*, 521; Clark, *Red Comet*, 577.

53. Plath, *Bell Jar*, 237.

54. Plath, *Collected Poems*, 269.

55. Plath, *Bell Jar*, 29.

56. Plath, *Bell Jar*, 31.

57. Plath, *Bell Jar*, 39.

skills, saying, “Even the apostles were tentmakers.”<sup>58</sup> Esther loathes the thought of serving men as a typist and wants “to dictate my own thrilling letters.”<sup>59</sup>

When Esther is asked to pose for a photo shoot in Jay Cee’s office, she is told to come with a prop that reflects her aspirations. She cannot decide what to use, and the photographer asks her what she wants to do with her life and career. Esther says, “I don’t know.” Jay Cee steps in and says, “She wants to be everything.” Esther relents and makes a choice: she wants to be a poet. A book of poetry would be too obvious a prop, the photographer explains, so Jay Cee unclips a paper rose from her hat and hands it to Esther. Having taken on Jay Cee’s floristic accessory denoting herself as a “career woman,” she narrates: “I stared through the frieze of rubber-plant leaves in Jay Cee’s window to the blue sky beyond. A few stagey cloud puffs were traveling from right to left. I fixed my eyes on the largest cloud, as if, when it passed out of sight, I might have the good luck to pass with it.”<sup>60</sup> It is as though the pressures of these decisions, even and especially at the very moment when Esther and Plath were encountering success in the world, led them to want to leave it behind. Plath thrived at Smith and *Mademoiselle*, yet these were in a sense artificial environments fighting against the atmospheric conditions outside of them. Outside, her opportunities were severely constrained.

In 1943, the Smith botany professors Margaret Kemp and Sara Bache-Wiig set out through correspondence with numerous research and horticultural institutions across the United States to learn what opportunities there might be for students with botany training, and which skills in particular were useful to them. Some institutions explained that they mostly hired men for their positions. They suggested typing and stenography skills—not unlike the advice Plath received from her mother.

Plath’s relationship to botany would be strained by these atmospheric conditions, as well as by complex allegiances to her parents. For example, in her journal during the summer after her botany course, Plath described her thirst for poetry and humanistic subjects ambivalently—as an outgrowth of her parents’ relationships toward the sciences and humanities. While Plath’s father Otto taught zoology at Boston University, her mother Aurelia was a literature scholar with a master’s degree from Boston University who left the field for child-rearing. Otto died when Plath was just eight years old, and she describes a longing to be schooled in botany and zoology as her father may have liked. Her focus on the humanities disturbs her insofar as it might stem from his absence and the outsize influence of her mother:

You wish you had been made to know Botany, Zoology and Science when you were young. But with your father dead, you leaned abnormally to the “Humanities” personality of your mother. And you were frightened when you heard yourself stop talking and felt the echo of her voice, as if she had spoken in you, as if you weren’t quite you, but

58. Plath, *Bell Jar*, 40.

59. Plath, *Bell Jar*, 76.

60. Plath, *Bell Jar*, 101.

were growing and continuing in her wake, and as if her expressions were growing and emanating from your face.<sup>61</sup>

After returning to Smith as a professor in 1957 upon completion of her Fulbright Scholarship at Cambridge University, Plath's perspective on academia and Smith College would shift, too. Filled with a gathering urge to write and to be unencumbered in doing so, her journal entries from this period express a bitterness about faculty life as it became clearer to her that she wanted to focus on writing full time. On January 21, 1958, she describes eating at the Smith faculty club: "Stuffy. Vacant. Botany professors forking raw tongue with dowdy seat-spread wives."<sup>62</sup> It is unclear whether this reference to "botany professors" might suggest a betrayal by Kenneth Wright, her beloved instructor from General Botany who was still teaching at that time, or the recently hired professor Robinson Shewell Abbott (or perhaps a visitor to campus). She describes the endless amounts of work that kept her from writing: extremely busy days, teaching without adequate preparation, and so on.

Perhaps coming to terms with the artificiality of the contained world she had been living in bred some resentment. Now, she could see as an adult that even Smith—so critically important to her intellectual formation as a student—was in her professional life suffused with the very same atmospheres of the broader world.

### Conclusion

Plath scholars often remark that she is too often remembered as a figure of darkness and death, when in fact she was full of life. This essay gives emphatic support to such a rereading. In Plath's encounter with *Pelargonium sidoides* we see the depth of her interests in life and the limitations imposed upon it. That cross-species connection helped her understand the human condition. She would have watched the plant, enclosed within the bell jar, fogging the glass as the humidity rose. She would have plucked leaves from this exquisite plant to bathe them in alcohol and iodine, as a way of understanding in intimate detail the metabolism of a living being that she found beautiful. Finally, she would have learned that this plant inhabits a world that is not its own—that it thrived within the confines of a conservatory through the care that Lyman horticulturists provided for it. When Plath describes "breathing my own sour air," this is a statement borne of her direct encounter with plants and the mechanics of plant transpiration. Botany might not be the sole source of inspiration for her metaphor—Heather Clark<sup>63</sup> points to a passage in a short story by Henry James that Plath had underlined, which describes the character May Bartram "under some clear glass bell," and Tracy Brain<sup>64</sup> points to a reference in a beekeeping manual—but her time in Botany 111 must

61. Plath, *Unabridged Journals*, 64–65.

62. Plath, *Unabridged Journals*, 315.

63. Clark, *Red Comet*, 509.

64. Brain, *Other Sylvia Plath*, 170n56.

have been especially significant given the timing of the course in her first semester of college, the fact that she was asked to draw the bell jar and plants underneath it, and the fact that her father was a botanist and pollinator zoologist.

Eventually, we see a shift in Plath's rendering of the bell jar. In her journal and in a letter to a friend while on summer vacation from college, she recounts life under the bell jar as rich and gay, even if routinized and intense. By the following summer, with her first taste of life in the working world at *Mademoiselle* magazine, and by the time she wrote the novel about that experience four years later, the bell jar became unambiguously a site of oppression and depression.

Like the plant conservatory, the bell jar is a technology for making dislocated life possible. The world Plath moved through in the United States and the United Kingdom of the 1950s was not built for her—it was not fit to support her and to receive her extraordinary gifts. It was only in spite of the constraints upon her that she achieved what she did. That she arrived at her transspecies insights at Smith College makes sense, given its long history with bell jars, including William F. Ganong's development of apparatuses for making plant physiology measurements. Plath entered her botany course at Lyman Conservatory as an English major and poet, an inheritor of a long literary tradition in which plant houses were used as figures for understanding the human condition under capitalist modernity. It also makes sense that these observations came from her time at Smith in another way: historically women's colleges have been their own kind of technology for helping people thrive in a world otherwise not built to support them and to receive their gifts.

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