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In Memory of Kenny Lau

Sarah Gates
News

I met Kenny a few months ago, shortly after I arrived at Caltech. He was the first person to welcome me to the Observational Cosmology group. When he started mentoring me, I had not yet committed to the group, so I expected him to give me some readings and maybe meet with me weekly. Instead, he met with me every day to show me how the cryostat's cooldown cycle worked. As I've talked to other students he worked with, everyone seems to have similar stories.

Kenny first came to Caltech in 2021 as a visiting graduate student. He joined the Observational Cosmology group in 2023 as a postdoctoral scholar working with Prof. Jamie Bock. Throughout his time at Caltech, Kenny worked to develop new technologies and performed analyses to test the cosmological models that describe the birth of the universe. One experiment, BICEP, searches for polarization signatures in the cosmic microwave background. According to Prof. Bock, "Kenny played a major role in BICEP's success in shrinking down the errors, which test our understanding of how the universe began. When he came to Caltech as a postdoc, Kenny applied his skills to new problems, including doing calculations for a space-borne successor to BICEP, which was his PhD thesis project at Minnesota."

Even in the rigorous environment of Caltech, Kenny's dedication to science stood out to those around him. "It was my true pleasure to advise Kenny," Prof. Bock says. "To be honest I also found it inspiring (and it's hard to inspire professors) because Kenny was so dedicated

and passionate about his work." Likewise, Marion Dierickx, one of Kenny's colleagues from a BICEP deployment at the South Pole, shares that "Even after a long and stressful season, on the very morning that Kenny was scheduled to leave the Pole that year (January 17th), he asked me if there was any work I wanted him to do while he traveled home... Kenny had the most exemplary work ethic of anyone I've ever worked with. The following year, he told me he spent the rest of the Minnesota winter running outside in order to 'toughen up' for the next Antarctic season." Another BICEP scientist, Sofia Fatigoni, remembers Kenny's passion for the project through a conversation at the South Pole: "One evening at dinner, someone pulled out their phone to show us a picture of their partner on their screen. Without hesitation, Kenny said: 'I also have a picture of the love of my life as my screensaver.' Then he proudly showed a photo of BICEP."

Despite Kenny's enthusiasm for science and demanding schedule, he always made time to support his friends and colleagues. "One of my fondest memories of Kenny comes from the months when I was studying for my qualifying exams at the end of my first year," says Anika Patel, a third-year graduate student in the BICEP group. "During that time, and without fail, Kenny was always there. He would check in on me, ask how I was doing, and even see if he could help me study... he made what was otherwise a lonely and stressful time so much better."

Over the past month, the third floor of Cahill has felt Kenny's absence in a number of small ways. Kenny was known to make two pieces of toast with peanut butter in the third floor



kitchen every day, according to a close friend, Yun-Ting. "On weekends or late evenings in Cahill, he would pop into my office, make an espresso, raid the candy dish, and ask what I was working on. If there were leftovers in the kitchen, he was always the first to show up with a smile," says Nancy Roth-Rappard, the PMA business supervisor. Kenny's close friend and colleague, Howard Hui, reminisces, "We remember celebrating birthdays together year after year, marked by his bright smile and unmistakable laugh. We remember gathering around a hot pot at home, sharing food and stories late into the night." In my own day-to-day life, I am continuing to experience Kenny's passion for his projects and strong mentorship through his notes and my conversations with his former students, as I endeavor to continue some of his work.

"Kenny was often the one who reminded us why we chose this path in the first place. He had a way of bringing the focus back to the beauty of science, to the joy of discovery, and to the idea that what we do matters, even when the work is difficult and the progress is slow," Howard reflects. I hope Kenny knows how much of an impact he's had on his students, his colleagues, and his friends in the Caltech community. We will miss him dearly.

Filming On Campus

Annie Zhao
News

Last term, Caltech cosplayed as Stanford for a week.

Fortunately (or unfortunately), it was not a prank, but instead a large filming operation for the upcoming film "The Love Hypothesis," an adaptation of Ali Hazelwood's novel of the same name. A sizable film crew worked at multiple locations across campus, capturing scenes in Kerckhoff, on Bechtel Mall, and most noticeably, around Caltech Hall Pond. Many students (your author included) wondered why filming occurred here instead of at Stanford.

"It's better for [a filming crew based in Los Angeles] to look for a comparable college campus locally than to attempt to film in another city or state," explains Janna Gould, the director of Finance and Operations at Caltech's Office of Communications and External Relations. "I will often receive inquiries from a show looking for buildings on our campus that may look like an 'East Coast Ivy' ... so we look for buildings with a fitting style and where there won't be too many palm trees in their shot." As a result, our campus has been well-represented in popular media over the years, serving as both Caltech (like in "Young Sheldon" and "Modern Family") and as a stand-in for other institutions. For example, recalls Ms. Gould, the legal drama "All's Fair" used Morgan Library and the Athenaeum to look like the offices of accomplished attorneys.

Usually, the process begins months in advance, when the production staff for a movie or show reaches out to Caltech's Office of Communications and External Relations. A scout arrives on campus to take photos and explore possible filming locations, reporting their findings to the director for further consideration. If Caltech is a good location, production staff begin to coordinate with Caltech to obtain the Institute's permission. "Filming opportunities come up quite often—multiple inquiries per week sometimes," says Ms. Gould, "but we move ahead with about three or four of them per year."

Most productions are turned down due to story content, logistical challenges, or scheduling conflicts. If the production wants to depict Caltech, the Institute's Office of Strategic Communications (OSC) reviews all production materials, such as storyboards and scripts. Conflicts with Institute events like Commencement are also considered. In addition, the filming operation cannot disrupt normal campus activities, as crews can be over 100 people, and some potential scenes

may have hundreds of extras. "We must consider the impact of that kind of footprint on campus life and research operations," explains Ms. Gould. "The academic and research functions of Caltech always come first."

After the permits come the fees. Caltech charges different hourly rates for filming depending on the size of the operation: still photography is cheapest at \$325 an hour, all the way up to feature films, which cost \$685 an hour. In addition, different locations have different "Location Use Fees," starting from \$3,000 per venue for campus exteriors, up to \$10,000 per day at the Athenaeum. There are also staffing fees for a filming liaison, utilities personnel, security, and parking.

If everything goes according to plan, the next step is notifying the Institute community, so nobody is taken by surprise. "Filming can involve street closures, impact to parking lots and pedestrian paths, as well as just a general uptick in activity and commotion on campus," explains Ms. Gould. "Our office works to mitigate the surprise nature of that." Offices and divisions are notified in advance, and announcements are sent out via Ion Caltech. Although disruptions are unavoidable, OSC tries its best to reduce the impact.

"I like to remind the crews that our campus is literally home for our undergraduate students," says Ms. Gould. "We assign Caltech staff to every location where a crew is present... so they aren't accessing spaces they aren't permitted or creating unsafe conditions or too much noise." To respect student privacy, areas in and around undergraduate housing may not be filmed. Active lab spaces are not accessible, and the dining facilities are not typically rented out.

In return, Ms. Gould hopes that students are equally respectful of the professional crews. Regarding Techers playing pranks, she reminds students that filming equipment is expensive and adds, "They also provide overnight security—so don't get any ideas!"

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Units: The Americans Have It Right

William Feasey
Opinion

If you wanted a measure of American assimilation, adherence to imperial/customary units (miles, Fahrenheit, etc.) and the month-day-year system of record would be a good place to start. What follows is a defense of these three American customs that so often become flashpoints in the most Caltech of dinner table conversations.

The following unitary arguments are grounded in common sense, meant for quotidian chit-chat, not to clarify a gluttonous trend toward evermore obtuse scientific convention. Richard Feynman famously bemoaned “the idiocy of all the different units which [physicists] use for measuring energy.” Thankfully today the Système international (SI) and her seven base dwarves permeate across most modern literature, after years of redefinition and tinkering. Anything other than a combination of these base units, tidied up with standard form, warrants an academic red flag. Metric prefixes are passable for verbal discussion but their ad hoc employment of capitalization (e.g. kilo- vs Mega-) makes for ugly reading.

Of course, it would be remiss of me to ignore the holy grail of all units: namely the dimensionless or unitless number.

Unshackled from the bonds of human-centric expression, freed from confusion of language or historical inertia, dimensionless quantities such as Mach number or refractive index convey physical meaning, not an isolated measurement. Science will never claim to stand in the divine realm of Kroecker’s and Hawking’s integers, but at least dimensionless numbers are a prize we humans can unambiguously show off to the rest of the universe.

OK, now less lofty and more Red Door debate. **Rule 1: the appropriate choice of unit maximizes the human-centric, full-scale range.** Given the inclement weather of late (c.f. Vol. CXXVII, Issue 9), let us apply this rule to temperature and how best to report it.

Temperature emerges from the daily ménage à trois of the Earth’s surface, cloud cover, and solar severity. Unless you happen to be a professional baker, temperature and weather are inextricably linked and therefore placing anything other than the human-meteorological experience as the basis of this measurement is pure catering to the kettle.

For the median human, life is lived somewhat confined to a 0-35°C regime (meet your opponent in their *echo chamber and waltz them over to your beat*). I submit that such a span is insufficient to describe

the subtleties of our temperate reality. Exams are marked 0-100%; human lives stretch ~100 years; childhood confectionery (*at least in my day*) is priced between 0-100 pennies; gym dumbbells run 0-100 lb. Save O(1) precision for a hinge date description; save O(100) discretization for batting averages. But O(10) descriptions are perfect for your everyday means.

And thus spoke Fahrenheit: the temperatures of life fit between 0-100°F. Those who tout the intuitiveness of a water-centric temperature scale are charlatans, or French, or both.

Rule 2: if there exists no significant full-scale range advantage, units should be selected on an aesthetic basis. Kilometers vs miles is the quintessential use case of such a rule and I am afraid, dear reader, that the Americans have it right once again.

Everybody and their advisor is running. Now if you have ever had the (mis)fortune of asking a runner about their running, they’ll tell you pace is the currency of their personality. You run fixed distances, with variable speeds yielding variable minutes.

— and you subscribe to kilometers — and you are reading a *California Tech* article — you are probably confined to a pacing of 4:XX minutes per kilometer.

The four becomes default and just takes up an obsolete digit of information. However, for us minutes-per-mile-ers, we have 6:XX, 7:XX and 8:XX all at our disposal. Furthermore, talking in kilometers represents a fundamental misunderstanding of the geometric progression of running distances: 100, 200, 400, 800 — fill in the blank. Finally, imagine you’re running, panting, verbally not at your best. How long is it until the end? ‘One-point-two kee-low-mee-ters’ you splutter back. The Proclaimers didn’t walk 500 kilometers, now did they. Stick to miles: one syllable of aesthetic sensibility.

Rule 3: convey maximal information in minimal duration. The final argument is on song with both our previous musings but is applied here to a clarification of date etiquette. I believe only a month-day-year system of record satisfies rule three. I hear your Pavlovian cries, bemoaning a non-ascending description of time. But I beg you apply a morsel of critical reasoning to your instincts. Ask why much of Eastern Asia speaks in year-month-day: chronological yes, but now descending in scope. Ask when, and for what purpose, do we report a three-step date? Next Caltech Rugby Session? — the following Wednesday (6:30 p.m., South Field). New Frank Ocean album? — oh

probably sometime next decade. Both days and years have their place but if you are going to give the full three-step specification, the month is the most useful piece of information and therefore should be placed in pole position. It serves to guide the recipient as to where their priority of retention should be directed, and perhaps the expediency with which they have to buy their fancy dress costume for your next party.

The dichotomies I’ve presented are much akin to picking between your favorite Olivias: Dean or Rodrigo. Do you want range and soul that speaks to the depth of the human condition (Fahrenheit) or do you want to reduce life to a never-ending breakup ballad measured in Swiftnic soundbites (Celsius). Do you want the punchy, monosyllabic Dean (miles) or the oft-tangled Rodrigo (kilometers). Has the precise Dean *already given you the time and place*, or has the vague Rodrigo *just gotten [her] driving license last week*. Despite what my Apple Music Replay might tell you, the choice couldn’t be clearer.

In sum: 996 words of wisdom, 49 bucks I’ll someday receive and 5 minutes you’ll never get back again. I hope you speak quantitatively of this article to your friends; I’ll leave the appropriate choice of unit as an exercise to the reader.

2025 Pasadena Coffee Passport: Final Round of Reviews

Victoria Davis
Column

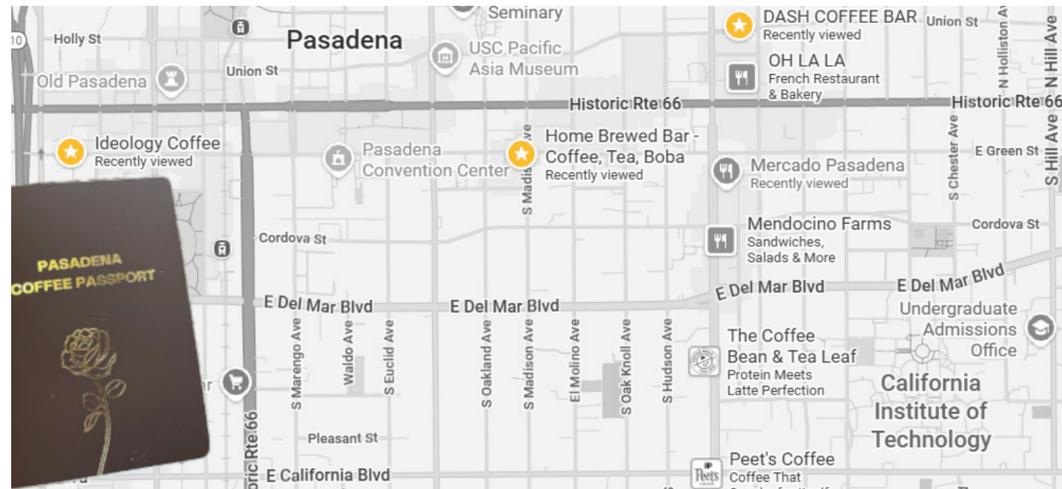
Happy New Year, Tech readers! Time to review the final three coffee shops featured in the 2025 Pasadena Coffee Passport! Two issues ago, I reviewed Highlight Coffee, Coffee & Plants, and Jameson Brown Coffee Roasters. This time, I have explored the last three coffee shops of the fourteen shops in the passport!

All photos by Victoria Davis.

Home Brewed Bar

Passport description: “This is one of the only places around where you can get your boba fix while you get your pick-me-up. Try their range of made-to-order coffee and tea drinks—boba optional!”

Passport benefit: 15% off
I visited Home Brewed Bar on December 9th, which was an unusually hot day for December. I decided to order an Iced Mocha and a Pizza Danish. I was recovering from a night of food poisoning, so it probably wasn’t the best idea to try out a coffee shop, but the passport was going to expire by the end of the month! I didn’t love the presentation of the coffee. I was handed a small, iced cup with a giant label slapped across it, and the label was bigger than the cup. The only straw they had was a large yellow one, which was probably better suited for a boba drink — it was obnoxious for a coffee. I didn’t like the taste of the coffee—take that as you will given that nothing tasted good for me at that moment in time — and I didn’t like the texture either. The



dash had bits of chocolate particles floating around, which didn’t help the way my stomach already felt. I couldn’t bear to try the pizza Danish, which was a shame because the concept of it sounded so good to me. I love pizza. Instead, I had my friend, Colin, try it for me and report what he thought. His review of the Danish is as follows: It is dry; the cheese and sauce are good. The olives are unremarkable.

Dash Coffee Bar

Passport description: “Stop by Dash for a break and a range of food options, pastries, coffee, tea, and other drink—even beer and cider! Here, you’ll find Southeast Asian flavor options like pandan, ube, and yuzu.”

Passport benefit: Buy one drink, get one drink
Because of the Passport benefit, I decided to try Dash with my Caltech bestie, Kayane Dingilian. We both ordered the Iced Dirty Thai Tea Latte. We both agreed it was AMAZING. It tasted just like a Thai Tea, but with more caffeine! It was absolutely delicious. It was sweet, creamy, and tangy, and was definitely a drink I am still thinking about and want again. Highly recommend, and would go again.

Ideology Coffee

Passport description: “Ideology Coffee quickly became a star in the Pasadena coffee scene after opening in 2024. Enjoy their high-quality coffee

and tea drinks, along with great food, in their warm and bright space.”

Passport benefit: 15% off
My final passport stamp was at Ideology Coffee. Sad to say, but it was anticlimactic. I ordered a Mocha Latte and a plain bagel with cream cheese. The bagel was okay. It had too much cream cheese—the center of the bagel with no bread was smothered with it. If you know me and my food preferences, it’s all about the perfect ratio of ingredients. There was way too much cream cheese to bread ratio for me, which is not often the ratio imbalance I’m used to for bagels! I also didn’t love that I could see the girl in the back room (who was waiting for my bagel to finish toasting)

take her hands and scroll on her phone then pick up a knife to put spread on my bagel...

As for the Mocha Latte, it was lukewarm the moment I got it. I don’t think I’ve ever had a coffee that wasn’t hot enough, so that makes my experience at Ideology Coffee a first. It made the drink gross, and I threw it away later. Very disappointing.

That’s all for the 2025 Pasadena Coffee Passport! Join me in my next column as I explore the San Gabriel Valley food scene with the 2025 MySGV Food Passport. This passport is valid from July 1, 2025 to June 30, 2026, so I will spend the first half of 2026 exploring the restaurants and bakeries of Pasadena featured here!

I Think I Like It? (A Devil May Cry 3 Review)

Clare Wu
News

Devil May Cry 3: Dante’s Awakening was first released in 2005 for the Playstation 2. I bought the game in 2024 for the Nintendo Switch. Still, I feel that I can give an accurate enough critique despite not playing on the intended hardware.

Overall, Devil May Cry 3 is a good game. However, I would say it is not an easily approachable game. This is a game for gamers. It’s a game for people who are looking for a challenge and a detailed combat system. It’s a game for people who are looking to feel cool as they gun down demons. It’s a game that would appeal to middle school boys of the 2000s, in a good way.

To begin with, Devil May Cry 3 is hard. So hard that I had to switch the game to Easy difficulty after dying due to the first boss ten times. However, I don’t blame myself for that decision, and I would actually encourage first time players to do the same. A fun quirk of the North American port of Devil May Cry 3 is that the “Normal” difficulty is actually the “Hard” difficulty of the original Japanese version. Thus, my choice to switch to “Easy” is actually a necessity to get the regular, original experience intended by the developers, and it is not a sign of cowardice nor weakness. To put it in a more familiar manner, it plays like Astro Boy Omega Factor plays on the Gameboy Advance SP on Easy mode. If you play on Normal, Hamegg’s giant goblin robot will “one shot” you. However, unlike playing Astro Boy Ome-

ga Factor, your left bumper will be able to survive unscathed.

A playthrough of Devil May Cry 3 centers around 20 missions. You play as Dante, a cocky demon-hunter and the son of the demon Sparda. At the beginning of the game, he has just opened a shop and ponders what to name it before being attacked by demons. From there, each mission centers around traversing a certain area of the Temen-Ni-Gru tower as he chases down his brother Vergil, who aims to open a portal to the demon world. The plot, to be honest, did not interest me much. I liked the characters and their personality, but I could not bring myself to really care about this portal to the demon world. I, personally, felt like I was just going through the motions of the plot to be able to play more of the game.

Speaking of gameplay, it’s quite fun and challenging. Having most of my videogame combat experience from Hades, I was expecting to be able to mash rapid fire attacks and mow through enemies. That felt like the kind of action one might expect from the suave, effortless Dante. However, what I got far exceeded my expectations in terms of how much I would have to actually use my brain to fight. The combat system relies on timing and precise button inputs to output combos and chain them together for style points. It’s incredibly satisfying to hit that flow state of killing an enemy just to immediately start attacking the next, all while nimbly dodge-rolling out the way of attacks. What’s more, Devil May Cry 3 boasts four different playstyles that you can master, meaning that

several playthroughs can feel unique depending on which you choose.

For my first playthrough, I chose the swordmaster class as I anticipated my smooth brain would instinctively gravitate towards braindead melee mashing. I quickly had to learn from my mistakes as I got my ass beat and died. Dodging is endlessly important and it took me almost half the game to learn that the direction you have to push the left joystick depends on where Dante is facing.

This unfortunately leads to my biggest gripe with the game. As much as this game relies on combat, it could really benefit from some kind of training area to test out combos and learn controls, similar to what fighting games have. In actuality, the way you learn combos is by reading a string of button presses and seeing a video. However, reading the combo does not help at all with actually learning it. For example, a common combo that I would accidentally input was the “crazy combo” which needed “X, X, a pause, X”, ending with the mashing of X. However, there is no indication of how long the pause should be. The only way you can learn is during the missions in active combat. I didn’t truly start enjoying the combat until Mission 15 (75% of the game complete).

Furthermore, combos are not exactly the same in what inputs are needed to execute them. As previously mentioned, things can change based on the direction Dante is facing. However, this means that they also change with camera movement. Unfortunately, the camera controls are incredibly frus-

trating. To begin with, there are a large number of rooms where the camera is fixed, usually at a strange angle, and you receive no indication that you are unable to move it. However, because the camera angle is determined by the room, there were quite a number of times where I would be holding the left stick in one direction to exit, only for the camera angle to change and immediately take me back to the room I had just left. It was incredibly frustrating and never stopped being annoying.

It also makes it much harder to keep track of the map. Navigation with inconsistent camera angles is quite the struggle. While there is a built-in map one can reference, it becomes hard to tell which door corresponds to what mark on the map and how one can get there. I spent a lot of time just running through every door available until I reached my destination. Additionally, the rooms look largely the same: grey brick everywhere and a general dark grunginess. While between missions areas are distinct enough, within a single mission it can be hard to tell rooms apart. When each mission is partially graded on time, it is extra frustrating that I constantly got a D in time as I spent most of it wandering around lost.

So if I didn’t like the combat, the map, or the story, how did I push through to enjoy the game? The music. The energetic rock of combat really does half the work of making you feel like the cool badass that Dante is. The soundtrack further blends seamlessly with the ambience of the ancient Temen-Ni-Gru and effortlessly

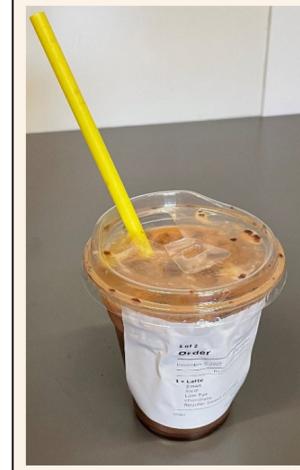
provides emotional backing to the cutscenes. It truly made up for my subpar skills.

It may sound like I did not like this game, but I must reassure you that it is a good game and I did like it. The boss battles in particular were some of my favorite parts. Since they naturally take longer to defeat than a horde of monsters, you can really get into that flow state of dodging, getting some hits in, and backing off. The first Vergil boss fight in particular really unlocked my understanding of this game’s combat. It’s just a shame it came in the latter half of the game. I’ll claim that as a skill issue on my part.

Perhaps what truly endeared me to the franchise was the ending cutscene, perfectly capturing how the series doesn’t take itself too seriously. After a dramatic last battle with Vergil, the brothers are separated once again. While Dante escapes back to the human world, Vergil stays behind. Feeling the loss of his brother, Dante cries. Lady, a character who has been following you throughout the game, asks “Are you crying?” Dante dramatically replies, “Devils never cry.” Lady then comments, “...Maybe somewhere out there even a devil may cry when he loses a loved one.” Then even after the ending credits scroll by, we get one final cutscene. We come full circle with Dante finally deciding on a name for his shop. We end on an exterior shot: surrounded by rubble, is the shop we started at: “Devil May Cry.” That’s right. They said the name of the game. 10/10.



Interior of Home Brewed Bar.

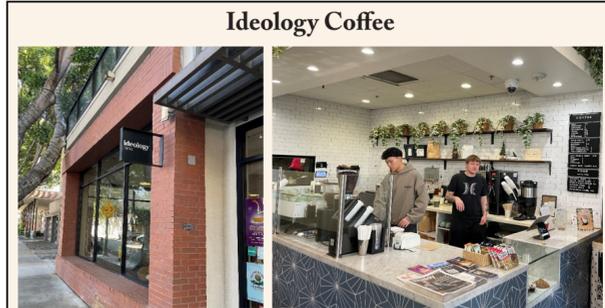


Iced Mocha and Pizza Danish by Home Brewed Bar.



Interior of Dash Coffee Bar.

Iced Dirty Thai Tea Lattes by Dash Coffee Bar.



Exterior and interior of Ideology Coffee.



Mocha Latte by Ideology Coffee.

A Journey Through Germany, Austria, and Switzerland

— San Pietro Summer Travel Prize

Miles Jones
News

This past summer I was fortunate enough to have been awarded a San Pietro travel prize. This enabled me to travel to Germany, Austria and Switzerland — countries I've wanted to travel to ever since I took my first high school German class seven years ago. I visited Berlin, Nuremberg, Munich, Innsbruck, St. Moritz and Zurich — an assortment of locations that were chosen to help me experience the culture of those three countries while also fulfilling personal interests. These included visiting the site of the Nuremberg trials, where my great-grandfather was a translator, going to multiple aviation museums, and long trail runs in the alps.

The specific locations of interest were all great, as they allowed me to learn more about my family, see aircraft not found in the United States and witness the beauty of the Alps firsthand. On top of that, I was also able to engage in the culture of the German-speaking countries, meeting nice, helpful people and partaking in the exceptional cuisine found throughout the region. The highlight of the trip, however, was when I got to see 2x Olympic champion, 4x world champion, 13x European track champion, 8x European cross country champion, 4x world record holder, and one of my idols, Jakob Ingebrigtsen, in St. Moritz. All in all, this was a truly incredible and life-changing experience for me and I am extremely grateful for the opportunity to make this trip.

All photos by Miles Jones



Me at the Brandenburg Gate in Berlin



Courtroom where the Nuremberg trials took place



Selfie of myself and Jakob Ingebrigtsen in St. Moritz



Selfie of me at the top of Piz Nair above St. Moritz



Alpine Lakes above St. Moritz.



The trail I took up to Piz Nair from St. Moritz



The only X-31 plane remaining in Flugwerft Schlessheim at Munich



View of the 1972 Olympic Stadium in Munich

Info from the FASA Office

The San Pietro application window is opening soon. If you are interested in applying for this award, please join the FASA Office for the information meeting and the budget workshop.

Information Meeting: Jan. 22, 2026 at 12pm in Brennan Conference Room

Budget Workshop: Feb. 3, 2026 at 12pm in Brennan Conference Room

The 2026 application deadline is **March 10, 2026.**

For more information go to fasa.caltech.edu

I Feel WICKED — Act II

Camilla Fezzi
Inner Voices

I'm Not That Girl (The Anthem I Didn't Want)

"Don't dream too far / Don't lose sight of who you are / Don't remember that rush of joy / He could be that boy / I'm not that girl!"

I had to excuse myself to the bathroom after this one. Just sat there in the stall crying, trying to be quiet. It felt embarrassing, but also, I couldn't stop because it felt like something inside me was finally breaking open.

It's not even about the boy. I mean, it is, but it's bigger than that. It's about being the person who talks themselves out of everything before anyone else can reject them. It's about being so convinced you're not "that girl" — the one who gets chosen — that you don't even try.

I know this song. I've been singing it in my head for years. Every time I talk myself out of speaking up, showing up, taking up space. This is my anthem and I hate that it is.

Not out loud. But in my head, when I don't apply for things I want. When I don't speak up in class. When I assume I'm not invited, not wanted, or not enough.

The worst part is how it sounds like wisdom. "Don't dream too far, don't lose sight of who you are." But really, it's just fear wearing a disguise.

And the thing that kills me is that later — spoiler again but whatever — we find out Elphaba WAS that girl. Fiero did see her. I chose her. Her whole tragic self-protection thing was based on a lie she told herself.

How many times have I been wrong about not being "that girl"? How many opportunities did I miss because I decided in advance I wasn't good enough? How much of my life have I

wasted protecting myself from rejection that might never have come?

(This is getting depressing. But also maybe necessary?)

Popular (The Violence of Trying to Fix People)

Ariana Grande is perfect in this. Too perfect. Which is exactly the point.

"Popular" should be funny — and it is — but it's also kind of horrifying when you think about it. Glinda isn't trying to be mean. She genuinely thinks she's helping by teaching Elphaba how to be more... acceptable.

"Popular! You're gonna be popular! / I'll teach you the proper poise when you talk to boys..."

It sounds so helpful. So generous. But listen to what she's actually saying: You need to be different. You need to perform femininity better. You need to hide who you are and become someone more palatable.

The song is about conformity dressed up as friendship. And the tragedy is that Elphaba wants it to work. For a minute there, she believes maybe if she just tries hard enough to be normal, everything will be okay.

But normal is a cage. And some of us aren't built for cages.

Defying Gravity (The Moment Everything Changes)

This is the song everyone knows. The big number. The eleven o'clock moment where Elphaba rises above the stage and you forget you're watching a movie because it feels like witnessing actual magic.

But sitting there in the theater, I wasn't thinking about the technical aspects or the staging. I was thinking about the exact moment she decides to stop playing by everyone else's rules.

"I'm through with play-

ing by the rules of someone else's game / Too late for second-guessing, too late to go back to sleep / It's time to trust my instincts, close my eyes, and leap!"

That's not about flying. That's about the psychological moment when you stop seeking approval and start trusting yourself. When you realize that being liked and being right aren't the same thing. When you choose authenticity over acceptance even though it's going to cost you.

I've never had a "Defying Gravity" moment. But watching Elphaba rise above that stage, watching her literally defy the forces trying to keep her down, something in me broke and whispered: What would it feel like to trust my instincts for once? What would it feel like to just... rise?

(Probably nothing dramatic. I'm not going to suddenly develop magical powers. But maybe that's not the point.)

The metaphor is perfect though. Gravity keeps us grounded, literally. But it also keeps us small. Safe. Predictable. And sometimes you have to fight against the fundamental forces holding you down if you want to rise.

Even if it means everyone thinks you're wicked.

The Green Skin Thing (Being Visibly Different)

Elphaba's green skin is the part of the metaphor I keep coming back to. She can't hide it. Can't minimize it. Can't make it more comfortable for other people.

There's this moment where Glinda says, "You're green," and Elphaba just says, "I AM." Not apologetically. Not defensively. Not trying to minimize it or explain it away. Just... claiming it. Owning it. Yes, I'm green. Yes, I'm different. I AM.

I want to be able to do that. To say I AM without

flinching, without apologizing, without making myself smaller so they can feel bigger.

Because here's what I'm starting to understand: The green skin isn't the problem. The world's reaction to the green skin is the problem. And we can't control other people's reactions but we can control whether we let their discomfort become our shame.

Elphaba spends the whole first act trying to fit in despite being green. By the end, she's powerful BECAUSE she's green. The thing that made her different made her magical.

Maybe that's true for all of us. Maybe the things we're most self-conscious about are actually our superpowers waiting to be claimed.

(I'm still working on believing this. Some days are better than others.)

What This Movie Did to Me (I Think)

I left the theater feeling weird. Not good-weird or bad-weird, just... different. Like something had shifted that I couldn't name yet.

It's been three days and I think I'm starting to figure it out.

I've spent so much time trying to be the right kind of person. Interesting but not weird. Present but not too much. Real but not too real.

But Elphaba doesn't do that. She tries, in the beginning. But eventually she stops managing other people's comfort and starts managing her own integrity.

And yeah, it costs her. People think she's wicked. She loses friends. She has to leave everything familiar behind. But she also becomes the most powerful person in the story. She also becomes free.

Maybe freedom and comfort are mutually exclusive. Maybe you can't

be free and safe at the same time. Maybe choosing yourself always costs something.

I don't know if I'm brave enough for my own "Defying Gravity" moment yet. But I think I want to try.

The movie gave me a different framework for thinking about these things. What if the things I think are wrong with me are actually just... different? And what if different can be powerful?

(I realize I sound like a self-help book right now. But also maybe that's okay.)

There's this line from "For Good" at the end: "Because I knew you, I have been changed for good." That's what good art does. It changes you in ways you can't undo. Shows you possibilities you can't unsee.

I can't unsee Elphaba rising above that stage, choosing herself over approval even though it meant losing everything. I can't unhear "I'm through with playing by the rules of someone else's game." I can't unfeel that moment in the theater when I realized I've been playing by the rules of someone else's game my entire life. So what if I played by mine?

So maybe that's enough for now. Maybe transformation doesn't happen all at once in one perfect movie-moment revelation. Maybe it starts with seeing what's possible and then learning to believe you deserve it too.

Maybe defying gravity starts with just... looking up. With imagining, for just one second, what it would feel like to rise.

I don't know how to explain what Wicked did to me. But I'm different now. Something shifted. Something cracked open and I can't close it again and I don't want to. I'm different now. And I think that's the point. I think that's everything.

Is It Love? Or Just Caltech?

A Jaded Upperclassman
Humor

Disclaimer: This is satire. Mostly.

Let's talk about the familiar experience of falling for someone on a campus so small that it may, in fact, be a social experiment. The experimental design: one insulated campus the size of a city block, two gossip cycles and maybe three eligible romantic candidates. Each has disqualifying traits, yet no one's left to take their place.

You find yourself obsessing over someone, not because they're especially attractive or even vaguely capable of emotional depth. They're simply there. On a campus where the dating pool is more of a dating puddle, they're somehow still available after frosh mating season.

You are not alone. Many have succumbed to the Caltech Mi-

rage: an unfortunate phenomenon in which repeated exposure to the same few faces begins to warp the soul. Suddenly, you're impressed with the fact that they held the door open for you at Red Door.

On this 124-acre campus, standards crash without mercy, much like REGIS during course registration. Someone with a pulse? Incredible. Someone who can communicate? Revolutionary. Someone with more than an ounce of emotional intelligence? A unicorn.

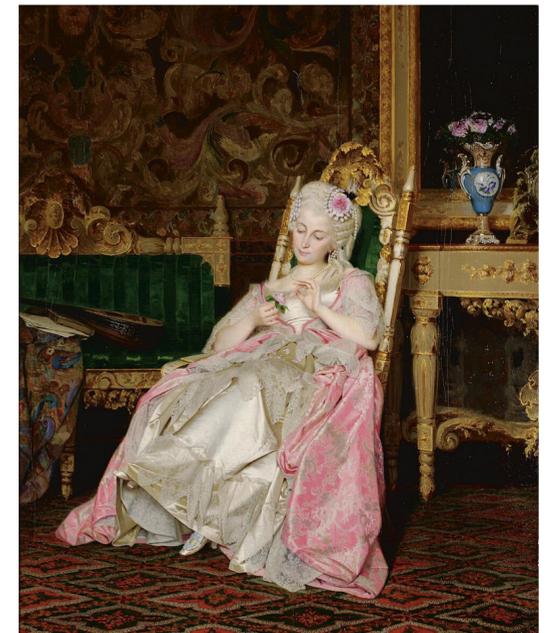
You are not in love. You are in a proximity-induced hallucination. In environments this insular, the same faces orbit your daily routine like moons until familiarity breeds connection, not contempt. At least not right away. It's exposure therapy disguised as a slow burn. This is not Cupid's arrow. This is boredom.

But let us be generous to your oxytocin-deprived brain. Perhaps you do enjoy their com-

pany. Perhaps you do light up at the sound of their terrible jokes (which might be a sign of prolonged exposure). You don't have to dismiss it as desperation. There's something poetic about finding closeness in proximity. Yes, your options are limited, but that doesn't automatically negate your feelings. Just because you're in a tiny pond doesn't mean the fish aren't decent.

It just means you have to be a little more honest about why you're drawn to someone. Is it chemistry? Or just shared academic trauma? Did they captivate your heart? Or did they just have a normal conversation with you? Only you can say.

Romance isn't dead. It's just heavily context-dependent and occasionally fueled by sleep deprivation plus a lack of better options.



Giacomo di Chirico, He loves me, he loves me not (1872). A fitting representation of having a crush on someone here, except the petals are fleeting interactions.

The Usefulness of the Useless

Ryan Ma
News

In March 2021, a digital collage file by the artist Beeple sold for an astonishing \$69 million at Christie's auction. The buyer of this **NFT** (non-fungible token) didn't receive a physical object or exclusive rights to the art — essentially, they paid for a **certificate of ownership** recorded on a blockchain. In practical terms, what they bought has no *intrinsic* use: it's a JPEG image anyone can copy. As one tech reporter put it, NFT buyers are often "just buying bragging rights and an asset they may be able to resell later." How can something seemingly *useless* command such tremendous value?

These examples highlight a fundamental question: Is value intrinsic or assigned by human systems? Why do humans often prize things with no obvious utility — whether digital art, luxury baubles, or idle pastimes — and even construct entire economies and meanings around them?

Zhuangzi's Wisdom: Embracing Uselessness

This mystery is not new. Over two millennia ago in China, Zhuangzi (Chuang Tzu) playfully illustrated the *use of uselessness*. In one story, Zhuangzi's skeptical friend Huizi complains that Zhuangzi's philosophical musings are "useless." Zhuangzi responds with a thought experiment: Imagine a person standing on a vast expanse of earth — they only use the patch of ground under their feet. If all the earth around that spot were dug away into a deep pit, what then? Huizi admits that ground would become impossible to use. "It is obvious, then," Zhuangzi concludes, "that the useless has its use." In other words, seemingly useless "extra" space — the earth not directly under our feet — is precisely what makes the useful part functional.

Zhuangzi drives home this lesson with vivid parables. He describes a giant, gnarled tree so misshapen that no carpenter wants it; deemed useless as timber, it's left standing for decades. The tree proudly tells the woodcutter that if it were useful (straight and fine-grained), it would have been cut down long ago — its very *uselessness* is keeping it alive and flourishing. In the meantime, that crooked old tree provides ample shade for animals and weary travelers to rest. What a conventional mindset calls "worthless" ends up *priceless* for those who enjoy its shade and for the tree's own survival. Zhuangzi suggests we "plant" ourselves in that mindset: "Why not plant it in the wilds, in the wide and boundless earth," he advises, "and stroll idly by its side... doing nothing by its side, and wander in ease under it? Axes will never shorten its life... If it has no use, it's safe from harm." Zhuangzi even chides his friend Huizi for a failure of imagination. Huizi once grew an enormous gourd and complained it was too awkwardly large to use; he smashed it as "useless." Zhuangzi laughed that Huizi was "dense when it comes to using big things," pointing out he could have turned the giant gourd into a boat and floated around in leisure! The gourd's value was lost only because Huizi tried to use it in a conventional way instead

of seeing its unorthodox potential. Zhuangzi's Taoist perspective celebrates looking beyond immediate utility, finding freedom and longevity in being "useless," and creative value in playful, novel uses of things. As Zhuangzi wrote, "*Everyone knows how useful it is to be useful, but no one knows how useful it is to be useless.*"

Luxury, Leisure, and Status

If Zhuangzi saw value in the useless by transcending material concerns, Western economists later noticed that material uselessness itself can confer value in social contexts. In 1776, Adam Smith noted the famous **diamond-water paradox**: "Nothing is more useful than water: but it will purchase scarce anything; a diamond, on the contrary, has scarce any value in use; but [it] may frequently be had in exchange for a very great quantity of other goods." In other words, **vital water is cheap, while useless glittering stones are costly**.

In 1899, economist Thorstein Veblen famously analyzed this habit of the affluent in *The Theory of the Leisure Class*. He observed that the wealthy engaged in "conspicuous consumption" — lavish spending on goods and activities precisely *because* they serve no practical purpose other than signaling status. "Conspicuous consumption of valuable goods is a means of reputability to the gentleman of leisure," Veblen wrote. In other words, owning expensive, functionally unnecessary items sends a social message: *I am wealthy and powerful enough to afford this useless luxury*.

Luxury art markets recently serve as a good continuing example. A decorative painting or digital artwork does not feed or shelter anyone, yet art can become an astronomical store of value in human society. The \$69 million Beeple NFT sale mentioned earlier positioned the artist among "the top three most valuable living artists" overnight. Why would collectors spend so much on a digital image? Part of it is speculative investment (hoping to resell at a profit), and part is the prestige of owning something unique and culturally notable. As the Christie's specialist who organized the sale noted, buyers see these digital collectibles as the "next chapter of art history", eager to get in early. In essence, the market assigned enormous exchange-value to a digital item with negligible use-value. Such value is not intrinsic to the object — it exists in the minds of people. Indeed, anthropologists note that value is a fluid, social phenomenon: what is considered valuable in one era or context may be worthless in another, and vice versa. Today's prized NFT can become tomorrow's forgotten meme and many more examples are explored later in this article.

Meaning, Work, and "Bullshit Jobs"

The impulse to find value in useless things isn't just about flaunting wealth — it also touches on meaning and self-worth. Nowadays, we have also created a vast number of jobs that even the people doing them secretly suspect to be pointless. Anthropologist David Graeber drew attention to this in his book *Bullshit Jobs*. He defined



Beeple's digital collage *Everydays: The First 5000 Days* — a JPEG file — was minted as a unique NFT and sold for \$69.3 million.

a "bullshit job" as "paid employment that is so completely pointless, unnecessary, or pernicious that even the employee cannot justify its existence".

Graeber was struck by surveys showing huge fractions of workers who feel their jobs contribute nothing meaningful. (In one 2015 poll in the UK, 37% of workers said their job made no meaningful contribution to the world, with another 13% unsure.) Paradoxically, many of these are well-paid white-collar positions — consultants, corporate lawyers, PR coordinators — that exist in part because of corporate or bureaucratic self-perpetuation. Meanwhile, truly vital jobs (teachers, nurses, sanitation workers) often receive lower pay and prestige. It's as if our economic system sometimes rewards uselessness (in terms of social value) over usefulness, flipping Zhuangzi's wisdom on its head.

Why would a society do this? Graeber argued that some "useless" jobs persist because of status quo inertia and a work ethic that equates *busy-ness* with merit. There's a cynical view that powerful interests prefer to keep people busy in employment, however meaningless, rather than free with too much spare time (an echo of the old saying "idle hands are the devil's workshop"). There's also psychological comfort for individuals and institutions in *feeling useful*, even if that usefulness is an illusion of paperwork and meetings. It's telling that early 20th-century economists predicted a very different future: in 1930, John Maynard Keynes imagined that by our era, technology would advance so much that people would only need to work 15 hours a week, devoting the rest of their time to leisure and creative pursuits. Technologically, Keynes was right — our productivity and automation have soared — yet people in 2025 are as busy as ever. Rather than ushering in a golden age of free time, increased efficiency has often just led to new forms of consumption and new kinds of make-work to occupy us. We seem to have trouble valuing *leisure* for its own sake, even though leisure (the freedom to do "nothing useful") can be deeply useful for our well-being, innovation, and happiness.

This paradox invites us to ask: Do we create pseudo-useful roles to satisfy a need for meaning and structure that a life of pure leisure might lack? Perhaps humans, craving purpose, sometimes *invent* it in

roundabout ways. A Wall Street analyst might privately feel their job is just moving money in circles, but that job provides social validation, income (with Graeber was struck by surveys showing huge fractions of workers who feel their jobs contribute nothing meaningful. (In one 2015 poll in the UK, 37% of workers said their job made no meaningful contribution to the world, with another 13% unsure.) Paradoxically, many of these are well-paid white-collar positions — consultants, corporate lawyers, PR coordinators — that exist in part because of corporate or bureaucratic self-perpetuation. Meanwhile, truly vital jobs (teachers, nurses, sanitation workers) often receive lower pay and prestige. It's as if our economic system sometimes rewards uselessness (in terms of social value) over usefulness, flipping Zhuangzi's wisdom on its head.

The Evolving Value of Ideas

Mathematician G.H. Hardy proudly asserted in 1940 that number theory was a useless pursuit, "the one subject... of which it can be said truly that it has never done anybody any good" (he considered this a badge of honor for pure intellectual beauty). Yet within a few decades, number theory became the backbone of modern cryptography — every time you use encrypted communication or secure banking online, you're relying on those once "useless" prime number theorems. As Ben Chugg noted, *Hardy's favorite useless subject, number theory, turned out to be central to cryptography*. The same story repeats: abstract physics research into quantum mechanics seemed esoteric in the 1920s, but today it enables semiconductors and GPS. Philosophical musings on logic and language laid foundations for computer science. Even Zhuangzi's whimsical philosophy, which might have seemed irrelevant in wartime China, now provides guidance for stress management and creativity in the 21st century.

This is why societies benefit from protecting space for the "useless" — basic research, humanities scholarship, art for art's sake, wild lands left undisturbed. The scholar Abraham Flexner wrote in 1939 about *"The Usefulness of Useless Knowledge"*. He pointed out that *most of the greatest scientific discoveries were made by men and women driven not by the desire to be useful, but merely by curiosity*. Unfettered curiosity — the freedom to ask "useless" questions — is the wellspring of innovation.

This perspective also encourages a bit of humility in how we judge value. It suggests **value is an evolving quantity**. Humans assign value based on current needs, desires, and narratives — but those can change, and radically so. The tulip bulbs that caused a financial mania in 17th-century Holland (famously trading for the price of houses) are today just flowers; conversely, Vincent van Gogh's paintings, virtually unsellable during his lifetime, are now considered priceless masterpieces. Our systems of money and merit often *lag behind* in recognizing real usefulness. (Consider how long it took for society to value clean air, or the decades during which computer science was seen as an academic curiosity.) The lesson is not to abandon all practical thinking, but to **allow diversity in what we value** and to keep an open mind. As Zhuangzi might say, don't be too quick to cut down the "useless" tree — you never know when it might offer exactly the shelter or inspiration we need.

- Sources:**
- Zhuangzi (Chuang Tzu), Daoist classic — parables of the **"use of uselessness"** (trans. Burton Watson).
 - Adam Smith, *The Wealth of Nations* — **diamond-water paradox** (value in use vs. value in exchange).
 - Thorstein Veblen, *The Theory of the Leisure Class* — concept of **conspicuous consumption** (status value of useless goods).
 - Nadia Khomami, *The Guardian* — report on **Supreme branded brick** resold for \$1000 (luxury hype).
 - Jacob Kastrenakes, *The Verge* — report on **Beeple's NFT artwork** selling for \$69 million (digital art value).
 - Nathan Heller, *The New Yorker* — review of David Graeber's **"Bullshit Jobs"**, includes a poll on meaningless jobs and Keynes's leisure prediction.
 - Abraham Flexner, "The Usefulness of Useless Knowledge" — role of **curiosity-driven research** in major discoveries.
 - Jean Bottéro, *Mesopotamia: Writing, Reason and the Gods* — **defense of useless scholarship** (Assyriology).
 - Fred Pearce, *Wired* — "Abandoned Farms for Biodiversity" — notes value of **rewilding "unproductive" land**.

Caltech Wildlife: The Pond Ecosystem

Jieyu Zheng
Caltech Wildlife

Happy New Year to the loyal readers of my wildlife column! With ample winter rain and a lower likelihood of wildfires this year, it feels fitting to begin the term by turning our attention to aquatic animals and the ecosystems they inhabit.

Although Southern California is generally dry, humans have long built artificial water systems to satisfy their aesthetic desires. Caltech is no exception. The campus hosts several iconic water features: the turtle ponds in Throop Memorial Garden, the Caltech pond in front of Caltech Hall (no pun intended), the Gene Pool, and the two lily ponds just south of Beckman Mall. These carefully maintained systems are full of life, and wildlife takes advantage of urban resources across different seasons.

As a birder, my personal favorites are the waterfowl that occasionally land on campus. Over my five years as a Ph.D.

student, I have seen mallards napping on the *Water Forms* sculpture at sunset, resting alongside turtles on sun-warmed rocks, and flying overhead with quacking calls. (Yes, ducks do fly high — see our previous article on [bird immi-grants](#).) Some especially lucky students have even spotted Canada geese that have abandoned long migrations in favor of the generous conditions provided by local parks. For me, however, the most thrilling sight is the flash of white wings from a snowy egret.

Snowy egrets feed primarily on fish and can engage in a concentrated state of fishing for hours. Last New Year's Day, while searching campus for coyotes to photograph, I encountered a snowy egret preparing its meal in the lily ponds. It worked methodically in the ponds with elegant techniques: stirring up mud with its long legs, holding its head perfectly still, then striking the water with precise accuracy at the exact point of

its gaze. By my rough count, more than half of its attempts were successful. It sometimes victoriously tossed a fish into the air like a chef stir-frying in a pan. The egret seemed entirely undisturbed by on-lookers gathered nearby with smartphones. The rectangular edges of the pond acted like velvet stanchions, keeping the paparazzi at bay as the celebrity bird strutted its red carpet.

Why are there fish in Caltech's ponds? Rumor has it that campus management intentionally introduced them to reduce mosquitoes during the summer months. While we still need to scratch our skins from mosquito bites, these small fish — likely mosquitofish or minnows — diligently protect us by feeding on mosquito larvae beneath the water's surface. In turn, they provide food for predators like turtles and egrets and form a simple but complete food chain.

Though we are in the heart of winter now, there is much to look forward to in the warmer

months. By summer, water lilies will bloom in white and pink, attracting dragonflies such as blue dashers and flame skimmers. Despite their small size, dragonflies are formidably skilled aerial hunters (their success rate may be higher than 90%). Their flight controls fascinated biologists for decades. Look closely, and you may spot a mating pair joined in midflight.

Of course, the most important residents to the pond

ecosystem—and perhaps to the student life at Caltech—are the turtles. After writing this column for a year, I must admit it is long overdue to address these animals that, according to more than 600 Caltech students, should be the alternative mascot. I have delayed this topic partly because I am no turtle expert and would love input from the Caltech Turtle Club. More on that in our next issue...

All photos by Jieyu Zheng.



The final moment of (possibly) a mosquitofish, captured immediately before the end of its short life.



The snowy egret hopped into the lily pond under the stare of a Caltech student.



The famous Caltech red-eared slider along with a tiny fish on the left side.



Pink water lilies that will soon bloom in the Spring term.



A blue dasher on the water lily. You will see many dragonflies in the summer.

The science of thought: philosophical insights into scientific practice

A Letter to Future Generations: On the Philosophy of Happiness — Part III

by Camilla Fezzi

Why Running From Pain Makes Everything Worse

It sounds counterintuitive, but trying to avoid all suffering can make you more miserable. If your life is organized around avoiding discomfort—skipping hard classes, avoiding difficult conversations, numbing out with Netflix and social media—it's not working, is it? You're not happier. You're just... numb. Beneath that numbness is a growing sense of emptiness. Both Buddhist philosophy and Western thinkers arrived at this insight: the attempt to avoid suffering causes more suffering than the suffering itself.

"Life is suffering. The cause of suffering is attachment. The cessation of suffering comes through the elimination of attachment."

— Buddha (563-483 BCE)

The Buddha's First Noble Truth—"life is suffering"—sounds depressing until you understand it. He's not saying life is *only* suffering or that suffering is bad. He's saying: stop being shocked that life includes pain. Stop expecting life to be smooth sailing. The suffering you're experiencing isn't a glitch in the system—it IS the system.

And here's where it gets interesting: the Buddha said that most of your suffering comes from *attachment*—clinging to how you think things should be. You're attached to the idea that you should be further along in life. You're attached to that person liking you back. You're attached to getting a certain grade.

The suffering isn't the grade itself—it's the gap between the grade you got and the grade you were attached to getting. The suffering isn't the rejection—it's the story you're telling yourself about what the rejection means about your worth.

Now enter Nietzsche. While the Buddha says "let go of attachment," Nietzsche says to "embrace the suffering and use it to forge yourself into something greater." He has this concept of *amor fati* (love of fate) that's like the Stoic version but more intense.

"What does not kill me makes

me stronger."

— Friedrich Nietzsche (1844-1900)

Yeah, that quote is overused in gym motivational posters, but Nietzsche meant something deeper. He's saying: hardship is raw material for becoming who you're meant to be. That heartbreak? It's teaching you about love and boundaries. That failure? It's showing you what you're really made of. That existential crisis at 3 AM? That's you actually grappling with real questions about meaning and purpose.

His idea of the *Übermensch* (overman) isn't about being better than other people—it's about continually overcoming your own limitations, transforming your pain into wisdom, and using obstacles as opportunities to grow. Think of it like this: suffering is the weight at the gym. You don't avoid the weight—you lift it, and that's how you get stronger.

So here's the synthesis: Accept that life includes suffering (Buddha). Stop making it worse by fighting reality (Stoics). And use that suffering as fuel for growth (Nietzsche).

The Existentialist Reality Check

The existentialists—Sartre, Camus, Kierkegaard—basically argued that life may not have inherent meaning.

Camus wrote about the "absurd"—the tension between humans desperately seeking meaning in a universe that doesn't provide any. His answer? Embrace the absurdity. Stop looking for some cosmic purpose that's going to make everything make sense. Paradoxically, once you accept that nothing "matters" in some ultimate cosmic sense, you're free to decide what matters to you.

"The struggle itself toward the heights is enough to fill a man's heart. One must imagine Sisyphus happy."

— Albert Camus (1913-1960)

Camus wrote about Sisyphus, the Greek dude condemned to push a boulder up a hill for eternity, only to watch it roll back down, forever. It's absurd. And yet Camus says: "One must imagine Sisyphus hap-



py." Why? Because the struggle itself is where happiness lives. Not in achieving some final goal, but in the process of striving.

This is comfort when you realize that you may never "arrive." There's no destination where you're finally done, finally happy, finally complete. It's all a process. And that's okay. That's actually beautiful.

Stop Living Someone Else's Life

You're not actually living your own life right now. You're living some Frankenstein version cobbled together from your parents' expectations, society's definitions of success, what looks good on socials, and what your peers are doing. The existentialists call this "bad faith"—pretending you don't have a choice, playing roles rather than being yourself.

You know that voice in your head that says "I should do this" or "I'm supposed to want that"? Where do those "shoulds" come from? Are they actually YOUR values, or are they just societal programming you've internalized?

"Man is condemned to be free; because once thrown into the world, he is responsible for everything he does."

— Jean-Paul Sartre (1905-1980)

Sartre's point: you ARE free. You're not trapped by your major, your past, your family's expectations, or your own previous choices. You can change direction. You can choose differently. This is both liberating and anxiety-inducing (Kierkegaard called it "the dizziness of freedom"), but it's the truth.

You're going to spend your early twenties trying to make everyone else happy. You'll pick classes to impress your parents. You'll pursue careers because they're "prestigious." You'll date people who look good on paper. You'll curate a persona that gets social approval.

And you know what? You'll be miserable. Because external validation is a drug—it feels good for a minute, but you need more and more of it, and it never lasts. You'll get the internship your parents are proud of and feel... empty. You'll get 500 likes on a post and feel... unseen.

Real happiness comes from alignment: when your outer life matches your inner truth. When what you DO reflects who you actually ARE, not who you think you should be. That's authenticity. And it's the only foundation for lasting happiness.

Know Thyself (Seriously, Do The Work)

Socrates gave us the most important homework assignment ever: "Know thyself." It is not some vague self-help, understand this: you CANNOT be happy if you don't know who you actually are.

"The unexamined life is not worth living."

— Socrates (470-399 BCE)

This means actually doing the work of figuring out:

- What do you actually value (not what you're supposed to value)?
- What are you naturally good at?
- What activities make you lose track of time?
- What kind of person do you want to be?
- What are your actual strengths and weaknesses (honest assessment, not an Instagram bio)?
- What would you do if you weren't trying to impress anyone?
- What legacy do you want to leave?

This isn't narcissistic navel-gazing—it's the foundation of everything. You can't build a happy life on someone else's blueprint. You need to know YOUR blueprint. And yeah, this requires reflection, journaling, therapy, long walks, honest conversations, and a willingness to face uncomfortable truths about yourself. Do it anyway.

MACH 33 Blast Off Party

Saturday, January 17 · 6:30-9pm
TACIT House · 275 S Hill Ave
Caltech, Pasadena

Meet the **MACH 33** and **Launchpad** playwrights and science advisors, hang out with members of the Caltech theater community, and get a sneak peek at the plays in this year's festival!

CLASSIFIEDS

Caltech Theatre Club, EXPLICIT presents:

A Midsummer Night's Dream

Sign up for auditions scheduled for January 22, 23, 24, and 25, 2026

Performances: May 1-3, 2026
at Ramo Auditorium

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LET YOUR VOICE BE HEARD!

Tell us your opinions about things going on at Caltech with this new survey form on our website! You can submit any time, multiple times, about anything.

THE TECH WANTS TO HEAR FROM YOU!

Three Sisters

TACIT House (275 S Hill Ave)
Saturday, January 17, 10am-3pm
SIGN UP: tacit.caltech.edu/audition

Rehearsals: January-April
Performance dates: April 18-19, 23-26

In Winter/Spring 2026, TACIT will explore Anton Chekhov's *Three Sisters*, a Russian tragicomedy adapted into late 1950s California. *Three Sisters* explores the gap between aspirations and reality, yearning for a better future, and the cost of inaction. This bold reimagining of this classic drama opens April 18th.

Editor's Note: We want to hear your perspective!

We strive to represent every voice in the Caltech Community with fairness, accuracy, and impartiality in our news reporting. If you think we missed something, or just want to share your thoughts about a topic we've reported on, I encourage you to submit a Letter to the Editor!

Send submissions or contact the Tech editorial team at tech@caltech.edu

Submissions are due at 12 p.m. on the Saturday before each biweekly Tuesday publication.

Ski Trip Meanings For Me

Camilla Fezzi
Inner Voices

The Language of Mountains

The sound is unmistakable. *Click-clack. Click-clack.* Hard plastic striking frozen asphalt. It is the music of 5:00 AM, played out in the dark parking lots of the Dolomites. I was three years old when I first learned the rhythm of it, my small, gloved hand lost inside my father's palm. The air didn't just smell like winter; it smelled of his black coffee steaming from a silver thermos and the sharp, metallic scent of snow guns working through the night.

We didn't speak much in those pre-dawn hours. We didn't need to. The silence of the car ride, the heater humming against the biting cold outside, was a conversation in itself. It was a ritual of presence. He was there. I was there. The mountain was waiting. In those minutes spent on the lift, we talked so much, always, my dad and I, so precious moments I will always bring with me.

My coach was a man carved from the same rock as the peaks above us. He taught me that skiing wasn't about fighting the mountain, but listening to it. "Let the edges talk," he would say. And eventually, they did. I remember the first time I truly felt it—the terrifying, electric jolt of speed as my tips pointed downhill, the wind tearing at my goggles, the world blurring into streaks of white and pine-green. It was freedom distilled into motion. For fifteen winters, that speed was my sanctuary, and the jagged white cathedral of the Alps was the only church I ever needed.

"Skiing wasn't about fighting the mountain, but listening to it."

The Silence of California

The acceptance letter to Caltech was a golden ticket, heavy with promise. But dreams have a weight, and mine was paid in altitude. Moving to California felt like landing on a different planet. I traded the towering, silent pines for palm trees that rattled in the dry wind. I traded the blinding white of the Marmolada glacier for the dusty brown of the San Gabriel foothills.

That first December was the hardest. The calendar said winter, but the thermometer

said spring. I walked across campus in a t-shirt, looking up at a sky that was relentlessly blue, feeling a phantom limb ache in my legs. I missed the burn of lactic acid. I missed the numbness in my toes. Mostly, I missed the car rides. I missed the silence with my dad. I realized then that we had spoken a language entirely our own out there on the snow. Suddenly, I had no one to speak it with. There was the first time we talked about my dreams, what I would have wanted to do after high school. There, he told me the most important sentence: "Camilla, you need to play in a different championship." After that talk, he gave me the wings to fly and to make my dream come true.

My car loaded with skies, all my memories came back.

A New Dialect

Then came the whispers of Big Bear. People said there was snow. People said there was skiing. I was skeptical. How could this Southern California resort compare to the giants of my childhood?

The drive up was different—winding through chaparral instead of spruce forests—but as the elevation climbed, the air thinned, and that familiar crispness returned to my lungs. The snow at Big Bear was different, heavier, wetter than the dry powder of the Dolomites. The runs were shorter. The peaks were humbler. But when I clicked my boots into the bindings—*snap*—the sound was the same.

Gravity, it turns out, works the same way in California. I pushed off, and the world fell away. It was like hearing a favorite song played on a different instrument; the notes were new, but the melody was home. My slalom, my love, speed, my safety.

Passing the Torch

I didn't just go back to the snow; I brought others with me. Now, as a member of the different houses at Caltech, I found myself in the driver's seat. The silence was replaced by the excited chatter of friends who had never seen snow, never felt the terror and thrill of sliding on two planks of wood.

I became the teacher. I became the one adjusting boots, wiping fogged goggles, and offering the steady hand.

There is a specific moment in teaching someone to ski. You see it in their eyes first. They

are fighting it, stiff with fear, leaning back. And then, you give them the cue—the same one my coach gave me, the same one my dad modeled for years. *Lean forward. Trust the edge.*

And then it happens. They turn. They don't fall. A smile breaks across their face that is so genuine, so full of pure, unadulterated joy, that it knocks the wind out of me. In that smile, I see myself at three years old. I feel the my father's hand on my shoulder.

"The mountains speak the same language everywhere. It is a language of love."

It is in these moments—guiding a housemate down a blue run, watching them discover their own speed—that the loneliness of my move to California finally dissolves. I am not alone here. I am building a new bond, forging a new community in the cold air. The solitary meditation of my childhood has evolved into a shared celebration.

Full Circle

I still chase the speed. I still crave that moment where the world blurs and there is only the next turn. But now, the joy is doubled.

Every time I help someone up from a fall, I am back in the Alps. Every time we drive back to Pasadena, exhausted and happy, I am back in the passenger seat of my dad's car. The geography has changed, but the heart of it remains untouched. I realized that the bond with my father wasn't left behind in Italy; it is alive in every turn I teach, in every ounce of confidence I pass on. The mountains speak the same language everywhere. It is a language of love, and finally, I am speaking it again.



My car loaded with skies, all my memories came back.



View from Big Bear top



The Quiet Bond

Rewriting Humanity: Why We Must Set Limits on Designing the Next Generation

Ryan Ma
Opinion

In the not-so-distant past, the idea of *designing* one's offspring belonged to science fiction. Genetic technologies were developed with noble aims – to cure diseases and prevent deadly inherited illnesses. Indeed, tools like in vitro fertilization (IVF) combined with preimplantation genetic diagnosis (PGD) have allowed parents at risk of transmitting serious disorders (such as cystic fibrosis or Huntington's disease) to have healthy children. These advances were initially about disease prevention, an extension of medicine to eliminate suffering before birth.

However, what began as a way to avert tragedy has steadily inched toward enhancing traits. Today, whispers of "designer babies" are growing louder. A little girl named Aurea, born in May 2020, was the first baby selected based on a polygenic score – essentially chosen from several IVF embryos for having the lowest risk of future disease. This marked a turning point: using genetic predictions to *optimize* a child's health prospects, beyond simply avoiding single-gene illnesses. Bioethicists at the Center for Genetics and Society pointedly called this new polygenic screening a reach toward "techno-eugenics".

Now, the wealthy are pushing the envelope even further. In late 2024, an undercover investigation revealed that a U.S. startup (operating in stealth mode) was offering to help wealthy couples screen their IVF embryos for desirable traits – including predicted IQ. For a price tag of up to \$50,000, clients could have 100 embryos created and genetically analyzed, then select one to implant based on a ranking of "IQ and the other naughty traits everybody wants," such as sex, height, and even lower risk of obesity or mental illness. The company's CEO boasted that this service could yield children who are "basically disease-free, smart, healthy; it's going to be great". What sounds like a sales pitch from a dystopian thriller is, in fact, reality for those who can pay.

These developments raise the question: *How is this allowed?* In the United States, the regulatory landscape for embryo selection and genetic editing is remarkably permissive compared to many other nations. There are no federal laws explicitly forbidding selection of embryos for non-medical traits. For example, choosing an embryo's sex for personal preference (not just disease avoidance) is legal and increasingly common in U.S. fertility clinics. In contrast, countries like the U.K. tightly regulate reproductive genetics – British law allows embryo testing only for a specified list of serious diseases, and explicitly bans picking embryos for traits like high IQ or height. The U.S. lack of regulation has made it a magnet for "fertility tourism" and entrepreneurial clinics ready to cater to parental whims.

The State of Genetic Customization Today

Yet even in the U.S., openly marketing designer babies is controversial. When a Los Angeles fertility doctor announced

in 2009 that he would let parents choose eye color, hair color, and other cosmetic traits, it sparked public outrage and condemnation from peers. He quickly withdrew the proposal. The technology at that time was crude – essentially an extension of PGD – but it showed the appetite was there. Now with big-data genetics and polygenic risk scores, the toolkit is far more sophisticated (at least on paper). Startups and IVF clinics are tiptoeing into this new era, often behind closed doors. The case of the IQ-screening startup, *Heliospect Genomics*, came to light only through an investigative sting operation. It revealed that at least five couples had already used the service and had pregnancies underway – proof that some elite parents are willing to be early adopters of embryo selection for enhancements.

What about direct gene editing of embryos? Here, there is a de facto red line – for now. In 2018, a Chinese scientist, He Jiankui, shocked the world by announcing the birth of twin girls whose DNA he had edited as embryos to make them HIV-resistant. The experiment was widely condemned as unethical and reckless; He Jiankui was fired and sentenced to prison in China. The case underscored the global scientific consensus that implanting gene-edited embryos is off-limits until safety and ethical issues are resolved. In the U.S., the Food and Drug Administration has explicitly banned clinical trials of heritable genome editing – meaning no CRISPR-designed babies can currently be legally born in America. Even leading researchers urging caution have noted that germline edits, unlike therapies on existing patients, would alter future generations and could introduce unknown harms. So for now, *CRISPR babies* remain beyond the pale. But the age of embryo selection is here, filling the vacuum: rather than editing genes, wealthy would-be parents can achieve similar ends by creating many embryos and picking the "best" one. This approach, as prominent bioethicist Henry Greely observes, can accomplish almost everything gene editing promised, without the technical risks of CRISPR.

All of this forces society to confront a crucial question: *where do we draw the line* on engineering our children's genetics? A broad consensus is emerging that a distinction must be made between medical necessity and elective enhancement. Using gene editing or embryo selection to prevent a child from suffering a serious disease is widely seen as an ethical use of technology – essentially an extension of preventive medicine. Surveys show strong public support for this. For example, a 2018 Pew Research Center poll found 76% of Americans approve of editing an unborn baby's genes to prevent a serious disease at birth. Even editing to reduce the lifetime risk of a disease (like heart disease or cancer) was supported by about 60% of respondents. There is a humane logic here: if we have the ability to safely eliminate a tragic illness that might afflict a child, many feel we should do so. It's the same reason PGD is accepted for re-

Drawing the Red Line: Health vs. Enhancement

moving embryos with lethal genetic disorders – a compassionate society wants to "avoid having affected children", as one UK geneticist put it. But that support drops off *steeply* when it comes to using these tools for non-medical enhancements. The public instinctively recognizes a moral boundary. The Pew poll showed that boosting a baby's intelligence or other talents is viewed as a step "too far" by a majority of Americans – only 19% said editing genes to make a baby more intelligent would be appropriate. Other polls have found similar aversion to tinkering with a child's appearance, height, or athletic ability. In short, there is a widespread agreement that curing disease is acceptable, designing "perfect" kids is not. This is the *red line* many propose: use genetics to treat or prevent illness, but not to create so-called "designer" children. Even many scientists who champion gene therapy have echoed this view, emphasizing that we should focus on medical benefits and avoid an upgrade-orientated mindset.

A Future of Genetic Haves and Have-Not?

Importantly, drawing this line isn't just about abstract ethics – it's about what kind of society we want. Crossing into enhancements raises profound concerns. One issue is the return of eugenics in a new form. Advocates of laissez-faire designer baby services often use the term "liberal eugenics" – the idea that individual parents, not the state, choose enhancements for their children. They argue it's an extension of parental freedom and ambition. Indeed, a consultant for the IQ-screening startup defended this as letting parents "improve their children's prospects once it's available". But critics note that even voluntary, market-driven eugenics can create a dystopian dynamic. If affluent families compete to buy the "best" genes for their kids, what does that do to the rest of us?

Allowing unrestricted genetic enhancement could dangerously exacerbate social inequality. We already live in a world of haves and have-nots; unfettered designer baby technology threatens to literalize that divide in our DNA. Science fiction has long warned of this possibility. The 1997 film *Gattaca* depicts a future society stratified into "Valid's" – those genetically optimized before birth – and "In-Valid's" who were conceived naturally and are deemed inferior. In *Gattaca*, one's genome is a social passport: the genetically privileged dominate top jobs and institutions, while others face discrimination and diminished opportunities. What was once fantasy is now uncomfortably close to reality. As a Scientific American commentator observed, *Gattaca's* scenario of "genetic haves and have-nots" could emerge if the wealthy alone can afford to make their offspring smarter, taller, or resistant to disease. The director of the 2010 film adaptation of *Never Let Me Go* (based on Kazuo Ishiguro's novel) likewise painted a chilling picture: in that story, human clones are produced to provide spare organs for their originals. It's an extreme hypothetical, but it

speaks to the core fear – that we might start seeing certain humans as mere means to an end, valued only for their engineered traits or biological utility. Even leading researchers caution that genetic enhancement could entrench privilege. Bioethicist Ronald Green warns that as the well-to-do exploit technologies to make themselves even better off, we risk widening the health and capability gap between rich and poor. A child of wealthy parents could be born free not just of disease, but endowed with extra enhancements – effectively given a head start that no amount of education or environment could overcome for others. Over generations, this might create a genetic class system, undermining the fundamental moral premise that all humans are created equal. "One of the biggest problems is that it normalises this idea of 'superior' and 'inferior' genetics," says Katie Hasson of the Center for Genetics and Society. If such a mindset takes root, people may begin to believe inequality is biologically determined and inevitable, rather than addressing the social causes of disparity. The stakes, then, are not just individual choice but the *character of our society*. Do we want a future where children's genomes are a luxury consumer product, and where those with "unenhanced" genes are stigmatized?

There are also scientific and ethical uncertainties attached to crossing this line. Complex traits like intelligence or personality are influenced by thousands of genes and gene interactions, most of which we scarcely understand. Predictions based on polygenic scores are probabilistic and often unreliable for an individual – a child rated as "high IQ" by an embryo test might still fall any-where on the spectrum of ability. This means many parents could be sold false promises, and many children could face unfair expectations. Furthermore, any form of germline editing carries the risk of unintended effects. CRISPR, for instance, can introduce off-target mutations or unknown health tradeoffs. The *CRISPR babies* in China may have gained HIV resistance, but some researchers worry they might have become more susceptible to other diseases, or that the gene tweak could have cognitive side effects. The full consequences might only be revealed as those children grow up – a human experiment that cannot easily be undone.

Potential Warnings from Fiction Works

It is telling that nearly every time a new milestone in genetic technology is announced, commentators invoke dystopian literature or films. Aldous Huxley's *Brave New World* imagined a society where human embryos are industrially engineered into castes – from intelligent leaders down to servile workers – conditioning people from birth to accept their predestined status. While our world isn't there, the moral of Huxley's tale resonates: *losing control of where science is taking us* can lead to a loss of our humanity. Some stories also highlight the emotional and psychological toll of a world with design-

er or purpose-bred children. In *Never Let Me Go* by Kazuo Ishiguro, the cloned youths grapple with the anguish of knowing they were created as means to another's end – it's a heart-wrenching meditation on the value of a human soul when society only regards your body. In a more relatable vein, consider the perspective of the *children* in a designer baby paradigm. If a child knows their parents paid to optimize their traits, will that burden them with crushing expectations? Conversely, if another child was born naturally and finds herself surrounded by genetically "enhanced" peers, how will that shape her self-worth?

A world that tolerates genetic augmentation of some children risks *dehumanizing* all children – seeing them less as persons to be unconditionally loved, and more as projects to be perfected.

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The California Tech Journalistic Principles

The News-Opinion divide

All articles shall be clearly and explicitly labeled as either News or Opinion/Editorial.

News articles report on topics that have been thoroughly researched by Tech staff writers, and should be impartial to any one point of view. In a News article, the writer shall not insert their own personal feelings on the matter; the purpose is to let the facts speak for themselves. The Tech assumes full responsibility for all content published as News.

In contrast, Opinion articles (including Letters to the Editor) may be written and submitted by anyone on any topic; while the Tech will edit all published Opinions to ensure no wrong or misleading information, we do not otherwise interfere. Again, the role of the Tech here is to help the whole campus communicate their ideas and share their stories, not promote specific ones. Content published as Opinions do not necessarily represent the values of the Tech or our staff.

An exception to this is Editorials, which are written by Tech staff and represent official opinions of the Tech. Any information and sources in Editorials shall be held to the same standard as News reports, but there is no promise or expectation of impartial coverage.

Fair Reporting

All facts of major significance and relevance to an article shall be sought out and included.

If an assertion is made by a source about a specific person or organization, they shall be contacted and given a reasonable amount of time to respond before publication. In other words, no second-hand information or hearsay shall stand on its own.

Quotes and Attribution of Information

Facts and quotes that were not collected directly by Tech reporters shall be attributed. Articles shall clearly differentiate between what a reporter saw and heard first-hand vs. what a reporter obtained from other sources.

Sources' opinions are just that — opinions. Expert opinions are certainly given more weight, as are witness opinions. But whenever possible, the Tech shall report facts, or at least corroborate the opinions. A reporter's observations at a scene are considered facts for the purposes of a story.

Sources

All sources shall be treated with respect and integrity. When speaking with sources, we shall identify ourselves as Tech reporters and clarify why we would like to hold an interview. Sources for the Tech will never be surprised to see their name published.

In published content, we shall put our sources' quotes into context, and — as appropriate — clarify what question was being answered.

We always ask that a source speak with us on the record for the sake of journalistic integrity. We want our audience to receive information that is credible and useful to them. Named sources are more trustworthy than unnamed sources because, by definition, unnamed sources will not publicly stand by their statements.

That being said, we realize that some sources are unwilling to reveal their identities publicly when it could jeopardize their safety or livelihood. Even in those cases, it is essential that the Tech Editor-in-Chief knows the identity of the source in question. Otherwise, there can be no certainty about whether the source and their quotes were falsified.

This also applies for Letters to the Editor and Opinion submissions to the Tech. If the author requests that their piece is published anonymously, they must provide a reason, and we shall consider it in appropriate circumstances. No truly anonymous submissions shall be published. Conversely, no submissions shall be published with the author's name without their consent.

When we choose not to identify a source by their full name, the article shall explain to readers why.

Corrections Policy

We strive for promptness in correcting all errors in all published content. We shall tell readers, as clearly and quickly as possible, what was wrong and what is correct.

Corrections to articles will be immediately updated on the online version of the Tech at tech.caltech.edu. If appropriate, corrections will also be published in the following Tech print issue.

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In any remaining absence of clarity, the Honor Code is the guiding principle.

The California Tech

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The QR code will be hidden somewhere within the pictured area.

TECH EDITOR'S CORNER

Bonus content, totally disconnected from any current events. From your favorite *Tech* editors <3

On Learning to Dissect Fetal Pigs

BY RENÉE NICOLE GOOD

i want back my rocking chairs,

solipsist sunsets,

& coastal jungle sounds that are tercets from cicadas and pentameter from the hairy legs of

cockroaches.

i've donated bibles to thrift stores

(mashed them in plastic trash bags with an acidic himalayan salt lamp—

the post-baptism bibles, the ones plucked from

street corners from the meaty hands of zealots, the

dumbed-down, easy-to-read, parasitic kind):

remember more the slick rubber smell of high gloss biology textbook pictures; they burned the hairs

inside my nostrils,

remember more the slick rubber smell of high gloss biology textbook pictures; they burned the hairs

inside my nostrils,

& salt & ink that rubbed off on my palms.

under clippings of the moon at two forty five AM I study&repeat

ribosome

endoplasmic—

lactic acid

stamen

at the IHOP on the corner of powers and stetson hills—

i repeated & scribbled until it picked its way & stagnated somewhere i can't point to anymore, maybe

my gut—

maybe there in-between my pancreas & large intestine is the piddly brook of my soul.

it's the ruler by which i reduce all things now; hard-edged & splintering from knowledge that

used to sit, a cloth against fevered forehead.

can i let them both be? this fickle faith and this college science that heckles from the back of the

classroom

now i can't believe—

that the bible and qur'an and bhagavad gita are sliding long hairs behind my ear like mom

used to & exhaling from their mouths "make room for wonder"—

all my understanding dribbles down the chin onto the chest & is summarized as:

life is merely

to ovum and sperm

and where those two meet

and how often and how well

and what dies there.

Let everything happen to you: beauty and terror. Just keep going. No feeling is final.

— Rainer Maria Rilke