The behavior of this bit of air better than a supercomputer model. The insight was, in a word, beautiful.

The cliché that beauty is in the eye of the beholder is, like most clichés, completely true. Beauty is not a property that something has, but is more a way of seeing, an orientation. During that night when I first realized math could be beautiful, convergence didn’t change: I did. This, I think, is the saving grace for the applied sciences. Environmental degradation is very ugly, but it can be studied in a way that yields beautiful insights into how systems work and fail, and those discoveries have the side effect of helping people.

As I worked on the smog project, I began to realize that, at least for me, beauty is not an option, but a necessity. Before I could study the effects of climate change, or come up with a clever new policy, I had to understand the interlocking systems at play in the environment. And before I could understand the complex dynamics of the world, I had to stare long enough to see the entire picture. Because beauty is intimately related to a sense of wholeness, to see something all at once is to see it as beautiful.

Strangely, in my quest to be useful, to optimize, I’ve had to slow down and look again for beauty. I’ve found that the danger of busyness, besides burning out, is that beauty is awfully hard to schedule. By the end of each semester, the space I’ve tried to leave for beauty—the creative-writing classes, the deliberate thinking through research problems, the math puzzles with friends—gets compressed as piled-up problem sets and meetings take more and more of my energy.

Beautiful things take their own time. Mathematics is stunning only if it is allowed space, if problems can go days on end without a solution. Otherwise it is a chore. I cannot even read if my mind is too heavy with things to do; focus scatters like startled birds.

I have trouble believing in something called human nature. But if there is a universal, I think it is the desire to be like other people, to take in what we admire about our friends and family and make it a part of ourselves. I worry about this, because numbers are much easier to copy than subtle things like a sense of curiosity or compassion. And we are absolutely flooded in numbers. Most great scientists have lots of papers and citations, CVs that stretch for pages. I know I fixate on the long lists of metrics that appear next to the names of people I admire on Google Scholar, and I get the urge to speed up my work to match.

The solution to the flood of numbers and metrics, I think, is to take beauty seriously—not to treat it as ornamentation to be added on top of some base level of measurable achievement. I worry that if I don’t focus on deep understanding, I’ll end up attempting to produce flashy papers and stylish achievements as quality falls away. It’s the scholarly equivalent of teaching to the test, of numbers polluting the way we learn.

After months of guiding the Beijing smog research through revisions and peer review, we finally published earlier this year. I’ve moved on to a new project, studying how deforestation has changed the monsoon rains in India. It’s another ugly problem, a small example of how we are unintentionally reshaping Earth for the worse. But there is also the opportunity for understanding a complex system, appreciating its beauty, and maybe even restoration.

Berta Greenwald Ledecky Undergraduate Fellow
Drew Pendergrass ’20, a physics and mathematics concentrator living in Pforzheimer House, has stopped to smell the roses.

SPORTS

Failure to Finish

Dreadful defeats—and a heartbreaking Game—produced the Crimson’s first losing season of the century.

At approximately 4:05 p.m. on November 2, the 2019 Harvard football season began unraveling. Until that moment, the campaign was proceeding in the style to which coach Tim Murphy’s teams had been accustomed for two decades. With six seconds remaining in the game at Harvard Stadium, the Crimson led Dartmouth 6-3. If Harvard could knock down a long Big Green pass into the end zone, its record would move to 5-2 overall and 3-1 in the Ivy League, positioning the team for an Ivy title run.

But even though two Harvard defenders got their hands on the Hail Mary throw.

Four score: With Yale’s Melvin Rouse II in vain pursuit, Harvard’s Aidan Borguet heads for the goal line. Against the Elis, the Crimson freshman back rushed for a series single-game record 269 yards and amassed four touchdowns on only 11 carries, a performance that helped him earn the Ivy League Rookie of the Year award.
from quarterback Derek Kyler, the Big Green's prayers were answered. The ball was grabbed by receiver Masaki Aerts, giving Dartmouth a miracle 9-6 victory. It was the most ghastly defeat in the 146-year history of Harvard football—for three weeks, anyway, until it was equaled, arguably, by a 50-43, double-overtime loss in The Game at Yale that nevertheless featured (besides a halftime interruption) a record-setting performance by an unheralded freshman Harvard running back. In between, the Crimson would lose in overtime to Columbia and by four points to Penn. Each Saturday drove another stake through the heart. The final record was 4-6—Harvard's first losing season since 1998.

This five-game losing streak, which began with a 30-24 loss at Princeton, was a nightmare of spotty play, gambles that backfired, and horrendously unlucky bounces. Amid the miasma, the team competed ferociously. Harvard could have won all five games—and should have won three. But when someone needed to make a play in crunch time, it was the opponent who made it.

After the Penn loss, Murphy pinpointed the problem. “Somehow,” he said, “we have a failure to finish.” Following the Yale game, he elaborated: “We played really hard every single game. At times we played really well. Statistically we were not as good an offensive team as we were a year ago. We were not as good a team overall. We didn’t have as many senior starters. The sum total of that was we had to just give everything we possibly had, just to be in the game in the fourth quarter. And I think that’s a testament to our kids. They never gave up. But there was just no margin for error in almost every game.”

The early season gave little hint that such epic calamity was on the horizon. A squad featuring a number of unproven players seemed to be gradually rounding into form. After a rocky 31-23 opening loss at San Diego, the Crimson impressively handled Brown 42-7 in the home opener (see “Reload and Fire,” November-December 2019, page 32). The following week the team from Howard University visited the Stadium in the first game between the schools. The Bisons, from the Mid-East Athletic Conference, were overmatched: Harvard won a crushing 62-17 victory. The Crimson successfully blocked three Bison punts during the game, with swift freshman defensive back Khalil Dawsey blocking a pair. (All season long Harvard would be among the nation’s leaders in blocked kicks, finishing with nine.) Another freshman, DeMarkes Stradford, blocked a punt and recovered it for a touchdown. Stradford also carried the ball six times for 108 yards and another touchdown. Junior back Devin Darrington, playing a little more than a half, amassed 115 yards and three touchdowns on 12 carries.

To finish the three-game homestand, Ivy rival Cornell came to the Stadium. The Big Red had upset the Crimson the previous two seasons. Not this time. Harvard won 35-22, and the stars were, improbably, its punters: friendly rivals sophomore Jon Sot and junior Sean McKeogh. On this day, both would excel, with Sot, last season’s All-Ivy punter, averaging an eye-popping 56.3 yards on three punts and McKeogh an excellent 41.2 on four. Senior defensive lineman Brogan McPartland had two sacks. Junior linebacker Jack McGowan had the Crimson’s first interception of the season. Harvard also forced three fumbles. Junior quarterback Jake Smith was solid, going 18-for-28 passing for 217 yards with touchdowns to four receivers.

Among the quartet were seniors Jack Cook and Cody Chrest, who were emerging as a reliable long-distance tandem. Chrest, who had played intermittently before this season, would finish as the Crimson’s leading receiver, with 45 catches. “Cody came out of nowhere,” said Murphy. “He had been fighting injuries his entire career. He finally got healthy and showed what he can do.”

Cook and Chrest also figured in the scoring the following week, a 31-21 victory at Holy Cross. Cook caught an 18-yarder from Smith in the back of the end zone, and Chrest and Smith hooked up for a 68-yard pass-and-run touchdown. There were other standouts, including McPartland, who had three quarterback sacks. He would end the season as the Ivy sack leader, with 9.5. “We knew he had that potential,” said Murphy. “Brogan gave us great energy and great leadership.”

But what had Holy Cross’s homecoming crowd really buzzing was the 76-yard punt Sot lofted in the third quarter, which flipped the field from the Harvard 14 to the Holy Cross 10. On the day, Sot and McKeogh dropped six punts inside the Crusader 20. “I feel like we’re in an alternate universe, the way our guys are punt- ing the ball,” said Murphy. At season’s end, the Crimson led the league in both average punting distance (40.2 yards) and net punting (38.8 yards per kick). Sot’s 42.3 average distance was easily the league’s best.

Harvard had started solidly, approaching Week Six with a 4-1 record. Had the first half provided a false sense of security? More rugged opposition—the better Ivy teams—remained. The first true test came the following week at Princeton. The defending Ivy champion Tigers were riding a 15-game unbeaten streak and were scoring points in droves. Harvard gave them all they could handle. The Crimson actually led at halftime 14-10 after a 73-yard Smith-Cook touchdown connection late in the second quarter. But Smith also threw three inter-
Harvard traveled to New York City to face Columbia, which hadn’t beaten the Crimson since 2003. That would change, again in disheartening fashion. Murphy pulled quarterback Smith after a 6-for-16 passing performance, replacing him with sophomore Luke Emge. Early in the fourth quarter McIntyre kicked a 25-yard field goal to put the Crimson ahead 10-7, but the Lions came back to tie with 1:45 left. In the overtime Columbia scored to make it 17-10. When Harvard tried to answer, Emge threw a pass to the right, intended for senior wideout James Batch, but the Lions’ Ben Mathiasmeier made a brilliant diving interception to end it.

Could the nightmare continue? The final home game, against Penn, showcased another way to lose. In the third quarter the Crimson took a 20-17 lead on a nifty double reverse that finished with Chrest sailing 18 yards into the end zone. But the Quakers riposted with an 82-yard drive that culminated in a sensational diving, ball-tipping catch by wideout Rory Starkey, one of several superhuman touchdown grabs by opponents this season. After Penn repulsed two promising Harvard opportunities—one that reached the Quakers’ seven—the 24-20 margin stood.

After what had transpired, you could have pardoned Harvard fans for looking to The Game with dread. Yale entered with an 8-1 record and a high-powered attack spearheaded by quarterback Kurt Rawlings, who also was clicking with a pair of fellow seniors (and fellow previous Crimson killers), receivers JP Shohfi and Reed Klubnik. But on this brisk, sunny day, nobody had reckoned with young Mr. Aidan Borguet.

The score was 3-3 in the second quarter when Wingfield made a sensational diving interception at the Yale 27. Two plays later, Smith flipped to junior wideout B.J. Watson on a bubble screen to the right. Watson dashed all the way into the end zone. But McIntyre’s extra-point try was blocked. Harvard 9, Yale 3.

Then it was time to unleash Borguet. With a little under two minutes left in the half, at the Yale 47, he took a handoff from Smith and ran to the right through a huge hole created by the Harvard offensive line, all the way into the end zone. This time Harvard tried to get that extra point back by attempting a two-point conversion, but it failed. At the half it was Harvard 15, Yale 3.

Halftime was a game in itself. After the two bands performed, a group of students emerged from the stands and sat down around midfield. Some held signs reading “Yale and Harvard United for Climate Justice.” They were protesting inaction on climate change, specifically demanding that both schools divest their holdings in fossil-fuel investments. As the minutes ticked by, more students—from both schools—came down from the stands. Several dozen police officers kept wary watch. Eventually the protesters left the field. Fifty were arrested. The game had been delayed by about 30 minutes past the prescribed second-half starting time (see harvardmag.com/game-protest-19).

When the game resumed, Harvard appeared to take command, courtesy of Borguet. On the fifth play of the first series, from the Yale 41, he ran to the left, cut upfield, and scampered the remainder of the 59 yards into the end zone. McIntyre kicked the extra point. Harvard 22, Yale 3.

Yale rebounded, partly thanks to a punt fumbled by Crimson freshman Gavin Sharkey. An Eli touchdown and a field goal brought the score to Harvard 22, Yale 13. But Borguet was just warming up. On the next series, from the Yale 40, he swept to the right, turned upfield, and just kept run-
three minutes before the Crimson punter, 8:51 remained. Harvard killed off more than a field goal. Harvard 36, Yale 22.

Placement master: Against Holy Cross, junior Sean McKeogh dropped five punts inside the Crusader 20. The Crimson punting tandem of McKeogh and sophomore Jon Sot (who was named first-team All-Ivy) combined to make Harvard the Ivy League punting leader with a net average of 38.8 yards per boot.

was the Crimson back squirting through a seemingly nonexistent opening and barreling upfield. Once again, he ran all the way for a touchdown, his fourth. McIntyre kicked the extra point. Harvard 36, Yale 19.

On the extra point, Yale was penalized for unsportsmanlike conduct, a 15-yard infraction that was assessed on the kickoff. From the Yale 45 came one those moments that was foreordained. It went two rounds. On the first play the Crimson drew blood. Smith found Chrest wide open for a touchdown. McIntyre kicked the point. Harvard 43, Yale 36.

The result of the overtime seemed almost impossible to see how—it ended up in the hands of Yale lineman Cameron Warfield at the seven-yard-line. On the next play and with 18 seconds left, Rawlings threw over the middle to Shohfi for a touchdown. Tuckerman tied the game with his point after. Harvard 36, Yale 36.

Tidbits: With Yale’s victory, the series now stands at Yale 68 wins, Harvard 60 wins, and eight ties...Jordan Hill ’21 was elected the 147th captain of Harvard football. Hill, a lineman from Silver Spring, Maryland, is a resident of Adams House and an economics concentrator...Freshman Aidan Borguet was named Ivy League Rookie of the Year. In addition, five Harvard players were named to the All-Ivy first team: senior offensive lineman Liam Shanahan, senior defensive lineman Brogan McPartland, junior linebacker Jordan Hill, junior defensive back Isaiah Wingfield, and sophomore punter Jon Sot. Junior running back Devin Darrington and junior offensive lineman Eric Wilson were named to the second team. Five more were Honorable Mentions...The 147th season of Harvard football will kick off on Saturday, September 19, 2020, at Harvard Stadium against Georgetown. —DICK FRIEDMAN