

Chemistry

by Gerald Everett Jones

~ inspired by a true story ~

and dedicated to
fans of Boychik Lit

You can't tell teenagers anything. That's because we think we will live forever. By the time we realize that's not true, we're older, in which case we're not teenagers anymore. Or we're dead, and we can't know anything, or at least we're not in a state of being that qualifies as being a teenager any longer. In any case, *quod erat demonstratum* – as my geometry teacher used to say – you can't tell teenagers anything.

I don't know how I got on the subject of geometry when I intended to talk about chemistry. Chemistry was my best subject in high school, and I don't mean the hormonal kind, although I worked pretty hard at that, too. No, I'm talking real chemical bonds, the molecular kind, not the body-locking, fluid-swapping kind, although that aspect came into play eventually.

Her name was Elizabeth Bressler – with a last name to match those nicely rounded, perfectly developed breasts of hers – but I'll touch on those, I mean, come back to her, later, and the chemistry we shared.

It all started because, in the chemistry department, I was ahead of my time, literally. I had transferred into the Baltimore school system from suburban Chicago, only to find that the beer-swilling crab crunchers of my

new home were on a totally different academic program from the beer-swilling sausage stuffers I'd left behind. In my four-year high school back on the verge of the Windy City, high school ran four years – freshman, sophomore, junior, senior – and so did the science curriculum – biology, chemistry, physics, and Advance Placement science, or AP. AP was a college-level course in one of the other three sciences so you could get a head start becoming a big man on campus. But in the Baltimore system, junior high ran three rather than two years, leaving only three for high school – sophomore, junior, senior. And so the science courses ran in parallel – biology, chemistry, physics – with no AP even possible. So when I transferred as a sophomore who had already completed freshman biology, I was a year ahead, at least in science. They put me in chemistry class, as I expected, but with a roomful of juniors. So I'd skipped a grade without doing anything, like it must be to fall through a wormhole in space and end up on the other side of the galaxy without having to waste any of your precious proton-drive fuel.

My new lab partners were a couple of seniors (the killer couple, I called them, and her knockers were not bad either) who complained almost immediately to the teacher, a dyspeptic Scotsman named Mr. Maxwell,

that I was not of their caliber. I hadn't been taught to wash out beakers properly (according to his rules). And what was worse, I didn't respond to direction (namely, theirs) – which actually further reinforces my contention that you can't tell teenagers anything.

So cranky Maxwell called me into his office and informed me that my fellow lab rats had ratted me out. Shape up, he told me, or you're getting reassigned. People apparently don't like people who skip a grade without earning it, especially if they then brag about it and compound the insult by comparing the cheap, Army-surplus lab gear furnished by the state of Maryland to the shiny, class-A gear they give you in the enlightened state of Illinois. Me, I didn't see the point of his threatening to remove me from their sway. Maybe he'd reassign me to somebody *I* could taunt and dominate. There were plenty of rats in the room, and some of them looked downright cuddly and cute in their fuzzy sweaters, although I'd not yet had an older woman.

Not that I said all this to Maxwell in so many words. I was missing the point, he said. He'd assigned me to the two top students in the school (yes, the killer couple), and I should count myself damned lucky. Because, he said, they are not only his star students, but they are also his specially appointed lab assistants –

meaning, they get certain janitorial and paperwork chores around the lab – and they *grade all the tests and papers* he assigns.

Point taken. So getting bumped off the starting lineup with the killer couple would cost more than just ego points. With them wielding the red pencil, I could forget about scoring bonuses on any exam or extra credit on any paper for the rest of the semester.

So I made nice to Bob and Babs (names changed to protect the guilty). You might even say I learned to be a shameless suck-up, a talent that stood me in good stead many times in the years to come.

Those two actually did teach me a thing or three, I found out in later life, and I have almost forgiven them for it. But what can you do when you're sixteen, you assume you will live forever, and no one but no one can tell you anything at all?

I survived that year and the next, after which I watched Bob and Babs motor into the sunset in the direction of a snobby four-year college, where I hoped as freshmen chemistry majors they would hook up with sadomasochistic upperclass lab partners with a penchant for conducting experiments using toxic substances on underage humans.

As I emerged into my own senior year of high school, the full sunlight of Maxwell's approval – won after two years of shameless sucking up – streamed down upon my only occasionally pimpled face. In lieu of the AP course I so richly deserved but could not take, he made me his lab assistant. I was joined by Elizabeth Bressler (I said I'd come back to her), and we were a remarkable pair (as were hers).

Liz had skipped a grade in junior high but had somehow not managed to earn enough credits to graduate a year early. So she had a light course load her senior year, leaving her time to spare in the chem lab assisting Maxwell (and me).

So it was that I looked forward to sixth period, when it would be just she and I in the lab, with Maxwell making only brief appearances. Every once in awhile, he'd emerge from his small office adjoining the lab to issue terse directives. But most of the time he'd be closeted in there, apparently indulging in long naps, judging from the low buzz of his snoring.

One of our standing chores was to use breadloaf-sized sponges to swab down the countertops in the lab. As Maxwell bustled in from the hallway to duck into his coven one day, he glanced over to see me puttering with the sponge as I happily chatted up Liz.

He abruptly turned on his heel, strode over to me briskly, and grabbed the sponge from my hand.

His mouth and nose scrunched up into a grimace, as though one of us had cut a huge, stinky fart. “What are you, applying makeup?” and he mocked my pathetic performance as he peppered the surface with dainty dabs.

“I just – ”

“This is how you wipe a table down,” he said, as he opened the tap to soak the sponge. He then traced long swaths up and down the table in long, neat, parallel rows, as if he were piloting a tractor in a cornfield. He finished by rinsing and wringing out the sponge, then repeating the procedure to mop up the beaded drops left by his first pass.

Having demonstrated the thoroughness he expected from us, he gestured with the sponge to emphasize the righteous cleanliness he’d produced on the gleaming counter, then included all the tables in the room with a wide sweep of the hand, gave me the sponge as though turning over a missile-launch key, and stomped off.

I shot Liz a pleading look as I weighed the soggy sponge.

“Now we know how it’s done,” she said quietly, as she wetted her own sponge under the tap.

That’s how a task that I’d expected would take five minutes took twenty as we methodically cleaned every counter in the room, in two passes. Then twice more, for good measure. Without exchanging a word, perhaps in further imitation of our mentor’s knowing silence, Liz and I divided the work. She did the fully soaked first pass, and I followed along dutifully to do the mopping up. We were a machine, and our synchrony was blissful.

But not all of Maxwell’s lessons were so easily learned.

Case in point, “The Strange Case of the Failed Vapors.”

Another of our regular tasks was to maintain the stock of chemicals the students used for their experiments. Each lab station was assigned a wooden tray with a couple-dozen partitions that held small, stoppered vials. Each vial, according to its label, held one particular type of reagent, a solution of acid or base diluted with distilled water. “Experiments” in the chemistry book involved mixing these reagents in prescribed amounts, sometimes heating them over a Bunsen burner, and observing and recording the results.

One of the experiments they do early in the course involves a four-foot-long glass tube, about the size of a fluorescent ceiling light. The procedure involves soaking two cotton balls in different reagents – one in hydrochloric acid solution, the other in ammonia, which is the acid's chemical opposite, called a *base*. Then, you insert the cotton balls in opposite ends of the tube, which is suspended in a rack on the lab counter. As the reagents in the cotton balls evaporate, the gases thus produced begin to flow in the tube, and they migrate toward each other. When they meet, the result of the experiment can be seen as a whitish ring around the inside of the tube, the result of a neutralizing chemical reaction between the acid and the base.

Newbies who've not done the experiment before expect the telltale ring to show up at the midpoint of the tube. In fact, it always appears in precisely the same place, but consistently closer to the ammonia end. The experiment demonstrates the difference in the molecular weights between the two reagents. Ammonia molecules are larger, more complex, and therefore heavier than the acid, and the ammonia gas travels more slowly in the tube. The ratio between the tube lengths subdivided by the ring turns out to be exactly

the ratio between the weights of the two types of molecule.

That's the lesson. At least, when it works.

Topping off the reagent bottles once a month seemed to me an unnecessary task. Each iteration of the experiment required only a few drops of reagent in each cotton ball, whereas mixing up fresh batches of solution meant donning rubber gloves, lab coats, and goggles, and decanting full-strength acid and base from liter-sized bottles. Besides being cumbersome and time-consuming, the chore also inspired some healthy fear. Maxwell had warned us that we would have to proceed slowly and cautiously lest one of the big, bulky bottles slip from our grasp, shatter on the floor, and splash our socks with a skin-searing chemical.

Now, there were twelve counters in the room – three rows of four. A team of two student lab partners per station made up a class of twenty-four. But there were thirteen trays. The extra one was a stand-by in case a tray got dropped during class, as could conceivably happen but never had, as far as I knew.

So it occurred to me that the thirteenth tray was essentially expendable. We could poach from its vials to refill those in the other trays – all without having to handle the dangerous supply bottles. And of course my scheme greatly reduced the time required to replenish

the trays, leaving Liz and I to pass the time more pleasantly. We weren't so bold as to engage in physical recreation – these were the chaste days of high school, not sinful college – but not having to work as we talked added a delicious surreptitious quality to our conversations.

But here came Maxwell again, and he was not smiling.

“These knuckheads are bungling the experiments with the tubes,” he complained. “And it’s so damned simple, what could go wrong?” As he stared at me, I realized he actually expected an answer.

“I don’t know, I –”

But rather than hearing my lame attempt at explaining something that mystified me completely, he simply barked, “You guys repeat the experiment a few times, and maybe you can figure out how they’re screwing it up. These kids, you know, you can’t tell them anything.” And he retreated back to his lair.

Liz gave me her characteristic smirking look again, and I loved her for it, seeming as it did to involve us in some kind of shared secret, even though I never figured out quite what the secret was.

We got into our lab coats and protective gear, and then we assembled tray, tube, cotton balls, and stand

on a counter, and proceeded to follow the elegantly simple steps of the experiment.

After a few minutes of preparation, I inserted the acid ball in the left end, and she popped the base into the right. We waited awhile, and I stifled a yawn.

After a full minute, no ring.

We had both done the experiment several times before, first as coursework when we took the class, then later as lab assistants when we supported other students. It always took just a few seconds for the ring to form, and like the distance calculations, the time lapse should have been consistent from one trial to the next.

We repeated the experiment four more times that day, each time with the same – that is, no – result.

As we were about to clear the counter at the end of the period, Maxwell hustled over: “Well?”

This time, Liz spoke. “It seems we’re doing something wrong, too.”

Maxwell looked totally stumped. “That so? Show me.”

It took two minutes to repeat the experiment in front of him.

Again, a negative result.

We all stared at the clear tube. Perhaps to appear more diligent, I checked my watch.

“Imagine that,” Maxwell muttered, and walked back into his office.

“This is stupid,” I said to her after he’d gone.
“There’s something he’s not telling us.”

“I know,” she said. “And it makes *me* feel stupid. Must be something really dumb we’re overlooking.”

“We’ll nail it next time,” I said.

With a meaningful glance over to Maxwell’s closed office door, she said, “We’d better.”

During our next session, we tried reagents from different trays. Then we tried different tubes, and we broke open a fresh package of cotton balls.

A dozen tries, a dozen total failures.

As we stared at yet another blank tube, suddenly there was Maxwell.

“So what is it? I can’t sleep at night.”

“Sir,” I said, “we still don’t know.”

Mercifully, he didn’t make us go through the motions again.

I described how we'd tried it all different ways, and he frowned in concentration as he appeared to hang on my every word.

"I'll get onto those people at the chemical supply company," he growled. "They're screwing us, I bet."

"I doubt that," I said, trusting in the common decency and sensibility of vendors who have long-term contracts to supply every school in the county at sizable markups.

"No," Liz piped up. "We still have plenty in the stock bottles. It's all the same stuff since the successful experiments the class did a couple of months ago."

"That so?" muttered Maxwell. "And of course you checked the chemicals in the stock bottles?"

He was looking at me.

"Actually, no," I said quietly.

To my surprise, he didn't look annoyed. "Well, humor me. Repeat the experiment one more time, and use reagents from stock. If those bastards are selling us water, that'll prove it."

He ambled away, shaking his head.

It took us the entire rest of the period – another twenty minutes – to gear up, get the stock bottles down from the shelf, and mix fresh batches of reagent.

When we finally popped the soaked cotton balls into the ends of the tube, it took just a few seconds for the ring to appear.

She looked over at me, and I probably turned red.

And here came Maxwell. There was no hiding the positive result.

“Whoa,” he said. “What’s up with that, do you suppose?”

Very quietly, and trying to sound as detached and objective as possible, I explained, “The reagent trays must all be contaminated. When acid mixes with base, the result is neutral. Probably the students aren’t too careful about replacing the stoppers, get ’em mixed up. You do that enough times, there won’t be any reagent left in the solutions to cause a reaction. It’s water in the bottles, all right, but not because anybody sold us bad stuff.”

Maxwell looked shocked, as though he’d been told the sky is green and the grass is blue. “I don’t get it.”

“Sir?”

“I don’t get it. You mix fresh batches every time you refill the vials, don’t you?”

I opened my mouth, but nothing came out.

Liz started to reply for me, “You see, actually, sir —”

Maxwell cackled like a witch whose poison has finally taken hold, and we could still hear him laughing cheerily as he retreated to his closet and closed the door.

Worse, every time he caught sight of me after that, he broke into a big, shit-eating grin.

Once he even slapped me heartily on the back.

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