

Futures

Halogen nightmares

Braving the elements. By Anatoly Belilovsky



ILLUSTRATION BY JACEY

The first thing they tell you is: no one has come back yet. This in itself isn't surprising, but the way the recruiting officer says it, it seems like they don't expect anyone to come back, ever. I hear intakes of breath around me, but there is no sense of movement. The room is pitch black; if I leave now, no one will see my shame. No one but me.

That night I dream of fluorine.

Fluorine has killed, or tried to kill, every chemist who tried to isolate it. Water burns in fluorine. So does asbestos. Fluorinated superacids dissolve paraffin, glass, platinum. Fluorine burns are insidious, taking hours to manifest, and are also very difficult to treat.

My fluorine dreams are of burning: of launch-pad fires like *Apollo 1*, of midair explosions like *Challenger*, or heat-shield failures like *Columbia*; short circuit, exterior delamination, straying too near the Sun.

In this one, I walk barefoot on boiling molten metal. Dream pain is a remote sensation

but the sight of flesh melting off the bones fascinates me. In the dream, I know the name of each bone I see, and I name them out loud before they too disintegrate, one by one, and I sink lower. Dream logic tells me I am not dead until my eyes descend into the liquid fire, and when they do, the dream allows me to die and so wake up.

I take my shower as cold as I can stand, and wait as long as possible before I put on clothes to report for breakfast.

The second day, they put you in a mock-up fighter cockpit and leave you there, alone, in the pitch dark again. The cockpit springs open if you make a noise louder than a whisper, or push something in it too hard. The windshield is inches from your nose, side hatches brush your shoulders, roof close enough to ruffle your hair when you turn your head. If they sense your fear, they take you out and send you home.

You are allowed to sleep; encouraged, even.

This is a test of nerves, not endurance. That comes later. The first hour, I hear others sob, call out for help; then it's quiet. I didn't sleep well the night before, and so I drift off, fitfully, and dream of chlorine.

Chlorine was the first halogen discovered, and is still the most abundant and easiest to isolate. During the First World War it was used as a poison gas. It causes oedema of the lungs.

The chlorine nightmares are of suffocation: suit failure during spacewalk, cabin depressurization like on *Soyuz II*, running out of stored oxygen. In this one, I am crawling through a tunnel, trying to escape from something I cannot see. I know it to be horrible; so horrible that, as the tunnel narrows and as breathing gets more difficult by the second, I keep on going till –

I wake up in my bunk, sit up, and give myself over to the ecstasy of breathing.

The third day, there are considerably fewer of us in the room. The folding chairs are replaced

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with chaises longues; sounds of rain and surf emanate from hidden speakers. We are given mathematical problems to solve. Drill instructors walk softly among us. They write down the names of those who fall asleep.

Bromine is less common than chlorine, and less reactive. As the bromide salt, it was once used as a sedative.

The bromine nightmare is of giving up – of watching aliens' missiles approach, of having control of point-defence systems, of thinking: why bother? Why postpone the inevitable? Everyone dies. Now is as good a time as ever.

When it's too late to change my mind, I hear my mother's voice behind me. She's calling me to dinner. I turn and see the house I grew up in, my parents, my sister, my best friend, both boys I liked in junior high. I reach for the control board knowing I'll never launch counter-measures in time, and wake up.

The five of us who are still here are naked in a room. The door is secured with five combination locks, each labelled with our names and

personal questions: grandmother's birthday, last four digits of Global ID, score of the last basketball game you played in high school. The answer unlocks that one lock.

Two DIs have fire hoses going full blast. The only way for each of us to unlock our lock is to have all the others form a human shield between them and the hoses.

We are done in two minutes flat.

Iodine

Iodine is a solid, and is also the heaviest stable halogen. The body traps iodine in the thyroid gland, where it is used in the synthesis of thyroid hormones. Radionuclide studies have shown that iodine stays in the body for years.

Iodine at room temperature is a purple-black solid, both volatile and crystalline.

The iodine nightmare is of me hurtling through the darkness of space beyond the orbit of Mars, solar cells degraded or fractured or misoriented, caesium cold and useless without power for the Hall-effect thruster.

Astatine

I don't know what the astatine nightmares are. There are no stable isotopes of astatine; all decay with half-lives in the order of hours at the most, seconds to minutes for the most part. The astatine nightmares wake me, sweating, from sleep, linger briefly and disperse in the morning light.

Some astatine isotopes undergo alpha decay. An alpha particle is a nucleus of helium, a noble gas. Noble gases also include neon, argon, xenon, krypton and radon. Noble gases are known for their reluctance to form molecules. All noble-gas nightmares are the same.

They are all about being alone.

Anatoly Belilovsky was born in what is now Ukraine, learnt English from *Star Trek* reruns, worked his way through a US college by teaching Russian while majoring in chemistry, and has, for the past 30 years, been a paediatrician in New York, in a practice where English is the fourth most commonly spoken language.

THE STORY BEHIND THE STORY

Anatoly Belilovsky reveals the inspiration behind *Halogen nightmares*

Halogen nightmares had its genesis in failed translations. I spotted a trilingual direction sign by a poolside in Las Vegas, that read: "Right, Izquierda, Gauche". My immediate response was 'your *other* right'.

Another, on a dish at a restaurant buffet, offered: 'Halogen trotters (pork)'. I started thinking of race horses at first, which didn't go very far but segued into 'nightmares'. And that led me to the question: which halogen is associated with which brand of horror? I pretty much had the story in my head by the time I had finished lunch — although it helped that chemistry was my undergraduate major.

