

*"The crime of poisoning from its nature must always be a secret one. It seems to have escaped the attention of those who have written on the subject that the practice of such an art requires the knowledge, not only of a dexterous toxicologist, but also of a skillful physician, for success must depend on the exact imitation of some natural cause" (Robert Christinson, MD, 1844).**

Lily Robinson was an attractive woman, with long dark hair and captivating green eyes. Although she was diminutive in stature, she stood out in a crowd. It was confidence that set her apart. She smiled secretly inside as she walked down Boston's fashionable Newbury Street. She had just been given another assignment, and the plan would be simple and elegant.

Lily gathered up her keys, hopped in her little red car, and headed to her Cape Cod home. There she could watch the waves and tend to her garden. When she arrived at the house, she donned a wide-brimmed hat and stepped outside to enter her sanctuary.

She was greeted by one of her favorite flowers in bloom; dark green palmate leaves with pale blue flowers that winked under their helmets. She tended her plants like delicate treasures and thought about what she would do. Yes, tea would be nice, she would like that.

The sun dipped farther into the ocean's edge as Lily took a walk along the beach. The algal blooms clogged the surface of the sea. The red tide was evident and shellfish beds were closed. She liked the idea of small dinoflagellates inhabiting mollusks and rendering them unfit for human consumption. In New England this summer there would be fewer mussels to pile high in plates filled with broth and butter. There was always someone who would defy the "No Shellfishing" signs and collect just a few mussels for his own consumption, and possibly his own death.

Bending down she picked up a perfect piece of blue sea glass, one she would add to her collection when she returned to the house. Lily liked collections. She had a large assortment of perfectly formed shells from the genus *Conus*. Such exciting mollusks. Some species hunt fish with a small harpoon they carry inside their shell. As the proboscis extends, the harpoon-like tooth bores into the flesh and injects *Conus* venom. The paralyzed fish is then reeled inside, engulfed, and digested.

Of all her collections her most prized was that of her toxic plants and berries. Carefully dissected parts were kept in small jars on a shelf or in neatly labeled plastic containers in the freezer to retain their potency. Some were species from her own toxic garden, while others had been collected from outside the United States and smuggled home, lost inside her suitcase for just a short time.

Lily Robinson's target was a man who threatened an entire nation. He worked at one of the most prestigious universities in the city and could not be reasoned with. They had tried. The brilliance of his younger days had given way to a thin bitter man with a wild mane of gray hair and untied shoelaces. He had created a technological breakthrough so revolutionary that the way all communications would occur in the future would be forever changed. All existing encryption codes

would be worthless. Yet this secret would not be contained within these borders if he had his way.

There would be a small dinner party to welcome a new member of this man's department, where Lily would be the guest of a colleague. It had all been arranged. It was to be a catered affair.

Lily wore a black dress, with black satin Jimmy Choo sandals fashioned with delicate crystal buckles. There was a touch of glitter on her décolletage. As she exited through the door, she slipped a small plastic container into her Prada bag.

Dinner began with a plate of steamed mussels and broth. The mussels had been cooked in a kettle with leeks, celery, onion, garlic, and parsley. When nearly done, the mixture was seasoned to taste with salt and cayenne pepper. The next course was a watercress and endive salad with olive oil, wine vinegar, salt, pepper, and paprika. The entrée consisted of wild salmon grilled with tarragon and rosemary. For the end of the meal, a luxurious chocolate mousse was served, accompanied by an herbal tea. Lily had seen to every detail.

As she drew in a deep breath, she folded her napkin in her lap and engaged the eyes of the dark-haired gentleman in the corner of the room. At that moment, just as the waiter was to collect the plates, the man with the long gray hair began to complain of tingling and burning of the lips, tongue, and mouth.

He started drooling and gulping down a glass of water to quell his thirst and ease his abdominal pain. His head ached, he felt cold. His colleagues rushed to his side. They felt a slowed pulse and noted his difficulty with breathing. He seemed confused and then began to vomit and seize. As his eyes closed, Lily knew that it would be over soon. She had made sure that it would be finished before the medics arrived.

Lily Robinson excused herself to the ladies room. She reapplied her eyeliner across her top lids, Urban Decay Covey. She liked that color. It was green with just a hint of glitter for sparkle. Then she moved her Rose Spectrum lipstick across her lips in swooping strokes and wished she could disappear into the summer night.

The listener is invited to submit suggestions on the exact nature of the poison used by Lily Robinson.

Recollections, Lily Robinson and the Art of Secret Poisoning. I hope to confuse my dinner companions' analysis of the events by providing a diverse meal that included mussels, parsley, and watercress. I anticipated the dinner guests would assume that the likely cause of death would be saxitoxin, the toxin responsible for paralytic shellfish poisoning, given that there were contaminated selfish beds in New England. This was not the case.

I chose to use the poison aconitine. Aconitine poisoning presents with similar symptoms to paralytic shellfish poisoning. The high concentration of aconitine I put in the tea ensured that my victim would die in the shortest period of time.

Aconite, monkshood or wolfsbane, aconitum species, e.g. *aconitum napellus*, is a perennial plant originally native to Europe. It has deeply divided palmate leaves

and flowers that are born off a long stock. Each flower contains five petaloid sepals, one in the shape of a monkshood or helmet with blooms that vary in color from purple to blue, to combinations of color.

One of the most powerful plant-derived toxins, aconite can produce severe poisoning with as little as 0.2 milligrams of aconitine, 5 milliliters of the tincture, or 1 gram of the crude plant.

Gastrointestinal manifestations of toxicity include the early onset of nausea, hypersalivation, and vomiting, while neurotoxic symptoms include peri-oral paresthesias, numbness, dysarthria, weakness in the extremities, ataxia, and fading consciousness, leading to seizures and coma.

Cardiac symptoms consist of characteristic bradyarrhythmias and hypotension, with life-threatening ventricular ectopy. Ventricular tachycardia and/or fibrillation precedes asystole.

QRS widening, a prolonged QT interval, and bundle branch block are illustrative of cardiac conduction disturbances. Toxicity advances rapidly and life-threatening cardiotoxicity may be apparent within two hours of the ingestion.

Death results from a malignant dysrhythmia or from direct myocardial depression and cardiovascular collapse. Compounds are primarily derived from the tubers or root stock of *Aconitum* species and are classified as diterpenoid alkaloids, i.e., a nitrogenous base formed from some CO² terpenoid precursors. Aconitine, mesaconitine, and 3-acetylaconitines are the most toxic alkaloids. It is the benzoyl ester side chain in carbon-14 that produces the arrhythmic effects ascribed to these three alkaloids.

The alkaloid content within the plant varies with the species, the geographic location, and the time of harvest. Aconitine is considered an activator agent that opens sodium channels, and it binds within the transmembrane region known as the neurotoxin receptor site 2.

This binding generates continual activation of the voltage gated Na⁺ channel at the resting membrane potential, and simultaneous inhibition of the channel in activation. These activators affect both the autonomic nerves innervating the heart and the cardiac conduction tissues, and both actions contribute to the clinical presentation.

Hypertension embryocardia are most likely caused by the activation of autonomic reflexes by the specific *Aconitum* diterpenoid alkaloids. This activation produces reflex stimulation of vagal tones, seen primarily as decreased heart rate and atrioventricular block.

My next assignment takes me to Washington DC, just after the November 2008 election.

*A Treatise of Poisons, 4th Edition. The Classics of Medicine Library. Birmingham, Alabama: Gryphon Editions; Special Edition 1988, p. 43.