

# THE ACCIDENTAL MYCOLOGIST

*An autobiographical note by Michael Beug*

In the seventh grade, I won a chemistry set in a blueberry pie eating contest and from that day forward I was determined to become a chemist and work for industry. One thing was certain. I never wanted to be a teacher—the work was too intense, and the financial rewards were too low. I was oblivious to mushrooms—until one day in about 1968 a fellow graduate student at the University of Washington gave me a bag of morels. I thought that they were better than the finest steak. On my first mushroom hunting trip to the Olympic Peninsula, I picked a couple grocery bags of a beautiful red mushroom with white warts on the cap. I brought them to campus, and no one could tell me what they were. That fall I was able to take a non-credit mushroom identification class from Dr. Daniel Stuntz. My quest for mushrooms was fully launched.

At the beginning of 1971, my final year as a graduate student, I had written a paper on how eggshell thinning in birds was not caused by inhibition of carbonic anhydrase and that earned me press coverage in *Chemical and Engineering News* and a second paper in the journal *Science*, but the enmity of environmentalists. Normally one does not publish a paper in two different journals. My carbonic anhydrase paper had been accepted by the journal *Biochemistry* and it was the editor of the journal who told me that it was important that this work also appear in *Science* or *Nature*, the two world premier journals. I chose *Science*. When it went out for review at *Science*, one of the two anonymous reviewers rejected the paper saying that the paper was not of sufficient interest to be published. A few months later, my paper appeared word for word in *Science* but with competing researchers from Florida as the authors. Two Nobel laureates intervened on my

behalf and were able to determine that the Florida researchers were the people who had reviewed my paper and rejected it, then stole my work. The *Science* editors then published my original paper but with no explanation. That rather soured me on academic research.

I started to apply for industrial jobs, but the economy was tight, and I was the only white male in the department to even be offered an interview. The interview was to go work for Union Carbide in Cleveland, Ohio. I had said that the one thing that I would never do is become a teacher, but I did not relish the prospect of living in Cleveland. I called my undergraduate thesis advisor, Dr. Myhre, at Harvey Mudd College for advice. By a somewhat unbelievable turn of events, he was going to be on Sabbatical the following year and asked if I would consider running his lab and teaching his courses. I jumped at the chance and the race was on to finish my thesis in time. I finished in July and in August started my one year visiting appointment at Harvey Mudd College.

Ann and I located a small, one-bedroom “carriage house” behind a grand home in Claremont, California, and a short walk from campus. There was no air conditioning and the first few weeks the temperatures were consistently over 100 F. Ann would come in with me and help in the lab. That way at least most of the day we were in an air conditioned building. We planted a tiny garden, but the smog ate holes in the lettuce leaves and the produce tasted of Eucalyptus. Some of the seniors would come over to make wine at our house and one senior made beer in the dorms. Two other seniors worked for me in the lab. One worked with me on Dr. Myhre’s research. The other student was interested in winemaking and was investigating the cause of oxidative

browning in white wine for the then new Robert Mondavi winery. We needed just 1/4 ounce out of each bottle for the research and enjoyed drinking the rest.

I really enjoyed teaching at Harvey Mudd even though my teaching schedule involved a class every day of the week and a Saturday morning lab. We found the faculty to be especially welcoming and collegial. I was able to resume flying with the Bates Aeronautical program and spend precious time with my undergraduate flight instructors, Howard (Critch) and Iris Critchell. Critch is gone now but I am still in regular touch with Iris. She had won a bronze medal in the 1936 Berlin Olympics (in the breaststroke), ferried warplanes from Southern California to the East Coast during World War II (her picture hangs in the Pentagon), and was still flying at 100 years of age. We did not talk about flying last time, just my most recent book, *Mushrooms of Cascadia: An Illustrated Key*. Critch had lived long enough to see my first book, *Ascomycete Fungi of North America* with coauthors Allen and Arleen Bessette.

After I had been teaching at HMC for two months, the Department Chair, J. Arthur Campbell, asked if I would consider staying on in a tenure-track position. I said that I would stay until The Evergreen State College in Olympia, Washington offered me a job. At Christmas 1972, Ann and I came back to Seattle to spend time with our families. Evergreen had never answered any of my letters or showed any interest, so Ann and I just showed up one day and talked to everyone we could. I even gave an impromptu seminar on my research. They told me how to complete my application and asked for two faculty letters of recommendation and two student letters. I promptly completed my paperwork and waited, and waited



and waited. No word. Then I heard that they had hired Jeff Kelly from Reed College. Jeff had graduated from HMC my freshman year and our research backgrounds were highly similar. I concluded that there was no way that Evergreen would hire me.

That first year at Harvey Mudd my salary was \$9,500 and we could just barely make ends meet. The raise they proposed for my second year was tiny. Ann and I talked it over and decided that I should go to the Dean of Faculty and ask for more money. Furthermore, I would quit if I did not get the raise and we would move back to Seattle where we were confident that Ann could again find work at the University of Washington hospital. I went in to meet the Dean and did not get the raise, so I resigned on the spot. As I headed back to the Chemistry Department the Chemistry Department chairman came out to greet me and to

say that Evergreen had just called. I was unemployed for only a few minutes. The entire Harvey Mudd freshman class had written a letter of support and that must have made my application stand out from the other 10,000 faculty applications Evergreen had received. The HMC Dean took the blame for my departure and was let go.

In Olympia we wanted a house with one to five acres of land but after a month of looking settled on a 2,200 square foot colonial house in a subdivision at 3732 Wesley Loop NW. It was about a mile from The Evergreen State College, so I could walk or bike to work. The lot was large—over 1/3 acre with deep rich soil in the back yard. We paid \$28,800, which seemed like an awful large amount at the time. In the fall, we started planting fruit trees and tearing out most of the back lawn for a large garden.

At Evergreen, I was assigned to the individual contract pool since the decision to hire me had been a last minute one. All the program teams had already been formed. The lab buildings had not yet been completed and so there was no way for me to do much chemistry. About five students wanted to learn about mushrooms and I agreed to work with them as a group. Some other students formed a group to learn basic chemistry, but with no labs. Had the labs existed, I would never have wound up teaching students about mushrooms—at the time a case of the blind leading the blind.

Olympia had been the home of Margaret McKenny, author of *The Savory Wild Mushroom*, at the time the only book available about Pacific Northwest Mushrooms. She had died a couple of years before we arrived, but had started a tradition of a fall mushroom show put on by the Olympia

Chapter of the Audubon Society. There I met Dr. Alexander Smith from the University of Michigan, then the foremost American mycologist. Kit Scates from Post Falls, Idaho was also there to help with the show.

Kit got me started photographing mushrooms and my brother Pat gave me a Canon Bellows with a 100 mm short-mount telephoto lens that would allow me to do macro photography. Kit, working with Dr. Daniel Stuntz of the University of Washington, had formed the Pacific Northwest Key Council in 1974. It was a group of serious amateurs dedicated to writing keys for the identification of Pacific Northwest species. I joined the group in its second year, focusing on photographing mushrooms for the keys.

As soon as I had arrived at Evergreen, Evergreen's ornithologist, Dr. Steven G. Herman, was after my scalp. My PhD work on the (lack of) effects of DDT and its metabolites on the enzyme carbonic anhydrase had been taken by industry as proof that DDT and its metabolites could not possibly be the cause of the egg-shell thinning that had caused species collapse of raptors and pelicans. After some tense discussions, we began to plan a two-year program, The Ecology and Chemistry of Pollution (ECOP).

Rachel Carson's 1962 book, *Silent Spring*, had led to the effective banning of DDT use in the United States. Farmers and foresters were fighting the ban. A huge outbreak of the Douglas-fir Tussock Moth in the Blue Mountains of southeast Washington and northeast Oregon had caused extensive defoliation of several hundred thousand acres of forestland by the spring of 1973. Steve and others had been testifying that in the spring of 1974, the population would crash from natural causes. Northwest loggers and ranchers were out for blood. The U.S. Congress was pressuring the U.S. Environmental Protection agency to approve use of DDT to control the Tussock Moth.

The construction of the lab buildings was under budget and in the spring of 1973, I went to work spending a big chunk of the remaining money ordering state of the art environmental analysis equipment that would allow us to study a wide range of pollutants. Over the summer of 1973, I assembled what



would become the ECOP lab.

The ECOP program was designed to introduce all students both to fieldwork and to laboratory analysis. I was to teach chemistry and lab technique. Steve was to teach natural history, biology lab and field technique. We had 40 students. Steve Herman and I started fall term off with a student field trip to the Blue Mountains of northeast Oregon to collect Douglas-fir Tussock Moth egg masses. Back at Evergreen, we incubated the moth egg masses to speed up larval maturation and then measured both levels of parasitoids and diseases (nuclear polyhedrosis virus and *Bacillus thuringiensis*). The egg masses were so heavily infected with parasitoids and

diseases that we predicted that collapse would occur soon after egg hatch in the spring. Steve and I both testified before U.S. Congressional committees (with the secret help of sympathetic Forest Service scientists who would lose their jobs if found out). Students flew to Washington, D.C. to testify at the cabinet level. NBC Nightly News sent a lead anchor, David Brinkley, to interview students. Russell Train, then head of the U.S. EPA also visited to learn the details of our work.

However, there was no cooling of the wrath of Congress. The EPA was given a stark choice. Either approve the use of DDT against the Douglas-fir Tussock Moth or have the EPA eliminated. Powerful senators from southern cotton

states were trying to get us fired, as was the Washington State Department of Agriculture and the City of Tacoma (due to other environmental messes we were attacking). Governor Dan Evans protected us.

In the spring of 1974, Russell Train, the second head of the EPA who served under Presidents Nixon and Ford, came to Evergreen a second time to personally tell us of his forced decision to approve use of DDT to save the EPA. David Brinkley also returned. Russell Train explained that he had instructed the EPA to set aside a huge study area that would not be sprayed and provided funding so that we could research what happened on the sprayed acreage versus the unsprayed acreage. Our final report, written by Steve Herman and one of the students was published as a wildlife monograph in 1976. That monograph was promptly used by Russell Train to finally end legal use of DDT. Amazingly, though the chemical had been first synthesized in 1874 and had been in use since World War II, we were the first to ever examine the effects of DDT on a forest ecosystem. Students had documented birds dropping from trees and dying of DDT tremors. They documented numerous other adverse environmental effects. While the insect population totally collapsed in the sprayed areas, it also totally collapsed in the unsprayed areas, as we had predicted.

The DDT work was only one of several ECOP undertakings. We also looked at the distribution of PCBs in sediments, mussels, fish and eventually cetaceans in Puget Sound. Some of the cetacean work continues today at Cascadia research in Olympia, founded by ECOP students and still run by an ECOP graduate. In those years, the National Science Foundation had a grant program for student initiated summer research projects. ECOP students wrote and were awarded grants to study the effects of fluorides from aluminum smelters along the Columbia River; the effect of arsenic and other heavy metals from the Asarco plant in Tacoma (the smelter is finally long gone); and the effect of lead and other heavy metals from the mines in Kellogg, Idaho. Washington State Fish and Game funded a study of a small stream in Centralia, Washington to see how to improve fish health. All in all, in the two summers of the ECOP program,

we brought in over \$250,000 to fund student stipends in the summer, pay for travel and pay for lab supplies. Not only did we accomplish the final full banning of DDT, but we established important baseline pollution levels for Puget Sound (long before anyone else was looking). We published our scientific papers and created a five-binder program history that presumably still resides in the Evergreen College archives.

The ECOP program officially ended after summer quarter 1975. However, for the 1975–76 academic year, Steve and I were both in the contract pool working with students who were wrapping up their research projects.

In the fall of 1975, I also taught a mini group contract on mushrooms. My students included Paul Stamets and Jeremy Bigwood who would continue to work with me on contract until Paul graduated four years later and Jeremy left about six years later. Almost immediately Paul, Jeremy and I began research on the cultivation of *Psilocybe* mushrooms and started doing quantitative analysis of psilocybin and psilocin levels in all Pacific Northwest species that we thought might be “magic mushrooms.” My students and others planned an international conference on hallucinogenic mushrooms held in the spring of 1976 at the nearby Miller Sylvania State Park. Similar conferences were held each year until about 1985, bringing together prominent researchers from all over the world. Before Paul and Jeremy arrived, I had never heard of *Psilocybe* mushrooms. They were not mentioned in any of my field guides. And the cultural and sexual revolution of the 1960s, my high school and college years, had passed unnoticed as I pursued my science, music, and aeronautics. A whole new world opened. We published a few new species, and several papers on psilocybin and psilocin levels in both wild and cultivated mushrooms (papers that 40 years later are again in high demand). Paul made extensive use of the college’s new scanning electron microscope (SEM) and I used it as well (I had not yet learned how to use a light microscope). Dr. Alex Smith would often drop by since he did not have access to an SEM at the University of Michigan. Jeremy and another student of mine, Jonathan Ott,

helped coin the term entheogens in preference to hallucinogens since the mushrooms increased empathy in users. I still maintain close contact with Paul, who has become quite famous for his mushroom cultivation work and many books on mushrooms.

I was now well underway to becoming a recognized mycologist, though I only got to teach a quarter-long full-time mycology program one more time before my final year of teaching when I got to teach a year-long full immersion mycology program that produced several professional mycologists. Then on post-retirement contracts, I got to teach two more Fungal Kingdom Programs. I still meet for a few days with every Fungal Kingdom class, a program taught every other year. Paul Stamets has funded two Michael Beug scholarships for mycology students. It is a great honor.

My proudest achievement remains being part of the team that finally ended legal use of DDT in the United States. The April/May 2022 *Smithsonian* magazine honors Earth Day 2022. Both they and the EPA web site give 1972 as the year that the EPA banned DDT and paved the way for the recovery of our national symbol, the Bald Eagle. Neither the Smithsonian nor the EPA website mentions the 1973 Congressional reversal of that ban. The date of the ban that stuck was 1976 or 1977. Since 1977, the Bald Eagle population has seen a 200- fold increase and, pelicans have returned to the Washington and Oregon coasts. As a boy visiting the family farm in Detroit Lakes, Minnesota, I had always wondered why a nearby lake was called Pelican Lake and the outflow stream was named Pelican Rapids. I had never seen a pelican. They are back now in large numbers. In the Columbia River Gorge where I live now, Osprey are common, Golden Eagles can be seen if you are observant. We now have a range of hawks visiting our land. I played a very real part and still thrill at the sight of all these magnificent raptors. I can sometimes see 50 eagles gathered, feeding on what is left of our still dwindling salmon runs. Much remains to be done and now I pass the torch on to you. Carry it well. The work has been intense, the rewards of teaching and learning have been boundless. 🍄