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Chapter 30

THE UNIVERSITY OF MICHIGAN BIOLOGICAL STATION (UMBS)

Inevitably, my descriptions of the two field stations, Rocky Mountain Biological Laboratory (RMBL) and University of Michigan Biological Station (UMBS), might be viewed as a comparison of them, since they differed markedly. However, each was critical to the development of my career and provided a unique experience for the entire family. The family experienced many joys from summers in two splendid, but dramatically different, ecological environments.

The UMBS was founded in 1902 and its "Crown Jewel" is Douglas Lake, which is shaped like a fish. A map is available at http://www.lsa.umich.edu/umbs/umbs_widedetail/0,2543,11189%255Farticle%255F18702,00.html. The station laboratories and housing are on South Fishtail Bay. The UMBS currently owns about 10,000 acres and is a Biosphere Reserve of the United Nations Man and the Biosphere Program. It is also a National Science Foundation Experimental Ecological Reserve and has a 3,200-acre tract on Sugar Island on the St. Mary's River near Sault Ste. Marie on Michigan's Upper Peninsula.

In late July or early August 1963, Robert Enders, Director at RMBL, informed me that he had a communication (probably a letter since RMBL had no phone) from Alfred Stockard, Director at UMBS, asking Enders if Stockard could obtain permission to offer me a summer position teaching fresh-water protozoan ecology. The UMBS summer session was then two weeks longer than the one at RMBL, but the distance from Gladwyne, Pennsylvania, to UMBS was less than half the distance to RMBL, diminishing my total time absent from the Academy of Natural Sciences (ANSP). In addition, I was to be paid a salary, which, even after deducting meals for five people for eight weeks and travel costs, was significant. Consequently, I had an opportunity to develop another course and teach at another institution. Unfortunately, I had already accepted an invitation to be a discussion leader in New Hampshire at a *Gordon Research Conference on Environmental Sciences: Water*, which was scheduled for the week before the summer session at UMBS started. It was a stretch to travel from New Hampshire to Michigan for the beginning of the session. I was scheduled to meet with UMBS students on the Saturday before classes began, but Director Stockard graciously gave me permission to arrive on Sunday – the day before classes actually began. I had been a discussion leader at a *Gordon Research Conference: Stream Sanitation* in 1956, so I had already experienced the system used in that setting.

As soon as the Gordon Conference ended, the family began the trip to UMBS (probably Friday afternoon). We took Route 89 from Tifton, New Hampshire, to the Trans Canada Highway, and from there to Sault Ste. Marie, Canada, where we stayed in a motel for the second night. From there, we crossed the border and drove south to Pellston, Michigan, then east to UMBS. We arrived early Sunday morning, unpacked, and I went to inspect my classroom/laboratory, talk to Director Stockard, and meet some of the other faculty. The family was assigned a spacious log cabin with room for everyone. The cabin had a bathroom, hot water, and a refrigerator, and it was only about 200 feet from Douglas Lake, which had a sand beach. The water was still chilly in June, but soon warmed up. Three meals each day were served to the entire family for the entire summer, but the costs took a substantial portion of my salary.

The UMBS had vehicles for class trips, microscopes, facilities for chemical analysis, and a superb library for a field station. My formal teaching covered two full days each week, plus much time between formal class periods spent with students on identifications. A large variety of aquatic habitats (bogs, fens, swamps, streams, lakes) was nearby, so the class had a superb opportunity to view a wide range of habitats. My 1964 class was small – six students – with only one US citizen, Bill Yongue, who subsequently worked with me for his PhD at Virginia Tech and was a valued colleague for many years after he joined the faculty there.

From 1961 to 1995, when massive blood clots in my right leg ended my field station days, the family spent about equal time at RMBL and UMBS, which is arguably the best evidence that we valued each field station. At RMBL in 1961, most people washed their laundry in tubs or at the Laundromat in Gunnison. Later, another faculty member, Keith Justice, found two old but serviceable Maytag washers for $15.00 each. I paid for one and Keith paid for the other. The washers even had power-driven wringers. Jeannie preferred using the old Maytags to driving to Gunnison. Also, she could step outside the shower/laundry facility and look at wildflowers in the meadow as she hung up the clothes to dry. Clothes dried rapidly in the dry mountain air on the clotheslines outside the washhouse.

At UMBS, a number of modern washers and dryers were available. Before becoming a biological station, UMBS was used for training engineers in surveying. Since the physical area had been extensively logged and was relatively flat, lines of sight were good. However, trees grew, especially aspen, and blocked lines of sight, so the facility

was turned over to biologists at the University of Michigan to be used as a field station. The housing in 1964 consisted of what was left from the engineering times – metal roofed buildings with wooden frames, floors, and doors. The student cabins were in clusters: "Manville," "Ladyville," and "Blissville" (married students). Most faculty lived in larger metal-roofed cabins along the lakefront. Each had a sizable living area with a pot bellied stove, two bedrooms, and a bathroom. A large communal dining room and a sizable kitchen were both in the same building, which was not far from our cabin. Students could earn money working as waiters and waitresses. Mrs. Hilda Kargo, in charge of the dining facility, had served as cook in a lumber camp before joining UMBS, which was a blessing because students at field stations are hearty eaters. Sidewalks were concrete, courtesy of the engineers, but the streets were dirt.

After the summer of 1962, the family began to miss one person, Karen, at a field station or at home since she began college that fall. Paul Ehrlich had not yet published *The Population Bomb* (1968), and Jeannie and I had four, widely spaced children: Karen, 3 November 1945; Stefan, 9 July 1949; Duncan, 2 March 1954; and Heather, 1 May 1959. In our youthful innocence, Jeannie and I thought that the spacing of the children's births meant we would never have two children in college at the same time. It almost worked!

Jeannie loved to swim, and a lake was practically on our doorstep at UMBS. Starting in 1965, our cabin was lakeside in faculty row and we remained there, but not in the same cabin, through 1983. On Saturday nights, Jeannie taught folk dancing on the volleyball court. During the warm parts of the summer session, the hot, tired dancers would, with a few exceptions, plunge into the lake at the end of the dancing. In later years, Jeannie kept score at the ball games played on a level field up the hill from the dining hall. The best insect repellent was Avon's *Skin-So-Soft*, so not only the ball teams, but also the spectators, smelled heavenly.

Arguably, the major social event of the session was the trip to Mackinac Island from Mackinaw City via ferry boats of the Arnold Transit Line. The island is a major tourist attraction, notable for the Grand Hotel and the fact that cars and other motorized vehicles are banned (except for fire engines). Horse-drawn carriages are a major form of transportation, and streets, especially in the hotel area, are swept regularly. Bicycles are also very common, and our family rented a batch and rode the approximately six-mile, paved road around the island. We usually ate lunch on the lawn of the large park overlooking the yacht basin. Our annual trip coincided with the Chicago to Mackinac Island yacht race on Lake Michigan. The harbor and yachts can be viewed at http://www.mackinac.com/content/general/about.html.

One of the family's favorite Sunday trips was a group picnic at Sturgeon Bay on Lake Michigan, about twenty miles west of Pellston. Usually three or four families participated: the Paterson family (Bob and Marian and their children Drew, Virginia [or Ginny], and John), the Cairns family, the Williams family (Gary and Gussie and their children Kevin, Brian, and Eric), the Shaffer family (Bob and Jocelyn and their daughter Martha), and Bill Fennel (a bachelor). The kitchen would supply picnic materials, such as hot dogs and hamburgers, and we would have an all-ages softball game, hike along the beach, and just sit on the beach chatting. We only had this group picnic two or three times each summer, but we all have fond memories of those beach parties.

Soon after my arrival at UMBS, I had a memorable short conversation with Alex Smith (mycologist), an avid trout fisherman. "Do you enjoy fishing?" *"Very much."* "Do you use artificial flies?" *"Of course."* "Do you tie your own?" *"When I have time."* "Do you use worms?" *"Not since I was 12 years old."* "Would you like to go fishing on Maple River tonight?" *"Delighted."* The third person that night was George Saunders (limnologist). I was dropped off at a deep pool on the Maple River just before sunset with the largest dry flies I had ever seen. I was told to practice casting, so I would know where the obstacles were in the dark. The fly was so large and had such wind resistance that "lobbing" would describe the process better than "casting." Alex and George had been gone for some time when the whippoorwills began to call. I assumed my situation was similar to the snipe hunt all novices are exposed to, and I checked the bushes to see where Alex and George were hiding. As darkness deepened, the hatch of the largest aquatic insects I had ever seen began. I could hear the "plops" of large, feeding fish. I was not on a snipe hunt! This scenario was fishing for large brown trout at night. I didn't catch anything that night, but, on two or three occasions, I managed to hook a trout briefly and felt a surge of power unique from all other experiences. Over the years, I managed to go fishing with Alex two or three times each summer, often in daylight but sometimes at night. When we got to the stream, one of us would head upstream and the other downstream – on small streams, it is best to be solitary. I never mastered night fishing for brown trout, perhaps because, for me, trout fishing is making a skillful cast that places the fly and line lightly on the water so that it floats down past the spot where a trout might be stationed with no drag (i.e., as if the fly were not attached to a line). One of my graduate students once remarked that fly fishing was my form of transcendental meditation. True, since fly fishing requires a focus that does not permit other thoughts to intrude.

Teaching at RMBL and the academic year National Science Course at Temple University provided me with confidence that I could teach and, since I produced four journal articles in 1962 and 1963, that I could get manuscripts published while teaching. I didn't know if two publications each year would be enough to show professional development. In 1964, my first year at UMBS, I had four manuscripts published, and all but one were in *Notulae Naturae* of the Academy of Natural Sciences Philadelphia, where I worked. The other publication was in *Industrial Water and Wastes*, a journal primarily devoted to industrial waste discharges. I

taught, carried out research on protozoan community dynamics, and worked on manuscripts, including books, at UMBS. These activities would not have been possible without the collaboration with William (Bill) Yongue, Jr. He was often, deservedly, first author (Yongue and Cairns 1971a,b,c) on the publications. Over the years, UMBS provided superb opportunities for collaboration (see http://www.umich.edu/~umbs/edu/research.htm under the UMBS bibliography).

In addition to the two field stations, another major factor influenced my professional career. In 1965, I published a small booklet, *Population Dynamics*, in the American Institute of Biological Sciences, Patterns of Life Series, published by Rand McNally, Chicago, Illinois; one book chapter; six journal articles; and one editorial. Not a bad total, but I did not have any publications on rapid biological information systems and fresh-water protozoan colonization dynamics – two areas I was eager to explore. UMBS gave me the opportunity to begin research on the latter. I was able to begin research on the former at the University of Kansas (KU).

Pellston Book Series

In 1976 I was asked to chair a committee for a workshop, "Estimating the Hazard of Chemical Substances to Aquatic Life," to be published, if the workshop turned out well, by the American Society for Testing and Materials as a Special Technical Publication. Two colleagues, Dr. Kenneth L. Dickson and Dr. Al Maki, would be co-editors. Participants were to include representatives from industry, regulatory agencies, and academe – a potentially explosive mixture! After consulting with Dickson, who had spent a summer at UMBS, and Maki, I approached David Gates, the UMBS Director at that time, to ask if the workshop could be held at the Biological Station before the 1976 summer session began. He agreed. I felt that the ambiance of a field station, surrounded by natural beauty, would compensate for the comparatively Spartan accommodations. They did.

In order that workshop discussion sessions be recorded accurately and be available immediately, I employed court recorders from Northern Court Reporters, Alpena and Petoskey, Michigan, to record the entire proceedings. I sat beside the court recorders throughout the week-long conference to be certain that technical terms were recorded accurately. The conference exceeded all our expectations, probably influenced by the following factors.
(1) All participants were convinced that all three groups could offer something valuable.
(2) Jim Daunter, the station chef, taught courses on the culinary arts during the academic year and could be depended on for superb meals.
(3) Daunter not only selected the wines and cheeses for the social hour, but he also gave such interesting talks about the qualities of each that the attendees requested unanimously that he do so every evening.

The workshop worked out well that first year (Cairns et al. 1978); consequently, Dickson, Maki, and I kept the series going (Dickson et al. 1979, 1982, Maki et al. 1980), but I dropped out after the 1982 book. The series is still going on (search "Pellston Series Books" on the Internet).

The workshop was named after Pellston by the 1976 participants because they were intrigued by tiny Pellston's "international" airport. The name stuck despite the various geographic locations where the meetings have been held and the different publishers. The second book was published by the American Fisheries Society, the third by The American Society for Microbiology, and the fourth by Ann Arbor Science Publishers, Inc., because we wished to call attention to the series to a diverse group of professionals. In recent years, the Society for Environmental Toxicology and Chemistry has sponsored the series.

UMBS and My Research Career

My son Duncan read the first draft of this chapter and observed that the sequencing is confusing. True, but this period was chaotic for both my professional career and our family life. Only with 20/20 hindsight do some of the events fit well. For example, the invitation to chair the Pellston Book Series indicated that my research on toxics and biological information systems had some merit. The research space assigned to me at KU was barely adequate for developing the apparatus and some preliminary testing. The steam pipes in the ceiling made temperature control impossible and would have diminished confidence in any data generated. Similarly, the research begun at UMBS on protozoan colonization of artificial substrates had merit as evidenced by my election as President of the American Microscopical Society from 1980-1981. One only knows these things years later, so chronological sequencing is not always the best way to consider this time period. Forty years later, I still view these events in terms of their impact on the family and my professional career. Life is often influenced by stochastic events.

When I went to KU in fall of 1966 and saw the tiny, inadequate research space assigned to me, I was in deep shock. I had expected to be at this institution for the remainder of my professional career. Worse yet, I had taken my family from lifelong friends and surroundings. I had left a secure position to develop new research areas that could not be easily developed at ANSP. Finally, I had always wanted to be with students but not sacrifice my research career. Writing my autobiography has made me realize how stressful that period was. For example, I cannot remember what the inside of our house in Lawrence, Kansas, looked like, although we lived in it for two years. This time must have been ghastly for Jeannie, but she never complained. Our personal lives were saved by three groups: two square dance

clubs, Jeannie's folk dance group, and the local Unitarian Fellowship. Jeannie had many friends in the Head Start Program, and we went to every concert and play at the university.

Professionally, three factors helped maintain my research momentum.

(1) I had two file cabinet drawers with sufficient data for quite a few manuscripts, which I began working on with considerable energy. Roger Kaesler (Geology, University of Kansas) was a blessing; he knew pattern analysis, and we completed many manuscripts together. In fact, our collaboration was so productive that we continued to co-author manuscripts after I left KU. Later on, Roger spent a sabbatical year with me at Virginia Tech.

(2) By the time I moved to KU, I had established a significant research program at UMBS, where I had superb research facilities. This situation alone might have maintained research momentum, but the appointments for UMBS were made one year at a time, and I was feeling insecure at that time due to the situation at KU.

(3) I had the great, good fortune at KU to meet Hampton Shirer, who knew more than enough to understand the rapid biological information systems I wished to develop but also enough about electrical engineering to build the monitoring systems (Shirer et al. 1968). Shirer (a faculty member) and two graduate students, Tom Waller and Rip Sparks, did much of the testing of the apparatus. Also, Frank Cross, an ichthyologist with the UK Museum, Rip Sparks, and I collaborated on toxicity testing research (Sparks et al. 1969). The KU Water Resources Research Center gave permission for me to take the monitoring apparatus, developed on a Water Resources grant, to Virginia Tech; I returned it as soon as the second version was completed. Three graduate students in my limnology course (D. W. Albaugh, F. Busey, and M. D. Chanay) worked with me on a biodiversity method useful for persons without formal taxonomic education (Cairns et al. 1968).

While Phil Humphrey was still at the Smithsonian, we co-authored a report for the US Army Corps of Engineers (Cairns and Humphrey 1969). We worked well together and would almost certainly have continued to do so, but I needed adequate space (unavailable to me at KU) for long-term research on rapid biological information systems. When Humphrey took over the administration of the KU Museum and the Department of Zoology, I was appointed Associate Chair Zoology for 1967-1968, which enabled me to stay in Lawrence until Stefan graduated from high school.

In fall 1967 and early 1968, I had attractive offers from four universities, three higher ranked nationally than Virginia Tech, but Bob Paterson, a colleague of many years at UMBS, was the new head of the Department of Biology at Virginia Tech. He offered me, in writing, a research position with abundant research space. Despite my recent bad experience at KU, loss of trust did not seem appropriate.

During this stressful period, UMBS was Jeannie's and my refuge. The natural surroundings were therapeutic – so was the UMBS "family." In fall 1967, I asked Waller and Sparks if they wanted to come along to my new position – they had already guessed that I was leaving KU. I was blessed that they were just waiting for me to tell them where and when. Four students (Jean Ruthven, Dickson, Waller, Sparks) were confident that we could establish a research program, and we did.

I will never know what Jeannie endured – she never discussed these things with me or the children. Her attitude was to put unpleasant events behind and "get on with life!" However, she had many friends in Lawrence, judging from the attendance at her "house closing" party. From Lawrence, Kansas, we drove to Blacksburg, Virginia, in spring of 1968 to a house we had never seen. Housing was tight, so we authorized Marian Paterson, who heard of a house that was available while at a bridge party, to pledge us to buy the house before the availability of it was announced to others. We arranged, again by phone, for a lawyer to take care of the legal details. The house was new and never inhabited; the owners were leaving town. The wife had visited it daily during construction, so we found only one defect.

The van with our furniture was a week late arriving, so we left from Blacksburg for UMBS as soon as the van had been unloaded. I didn't even check three times to verify that the doors were locked. We arrived in Michigan barely before UMBS classes began. However, the high stress period was over, and we were back in the UMBS family. I began teaching Stressed Ecosystems in 1973 and continued teaching that course through 1983. In 1995, I returned to UMBS to teach a one-week, pre-session course on stressed ecosystems" and that summer was the last time Jeannie and I were at UMBS. Our daughter Heather and her family live in Ann Arbor, Michigan, and have visited UMBS many times. Our granddaughter Laura Cairns Chambers, Heather and Carl's youngest daughter, was a student at UMBS in summer 2006.

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