

JOE HICKEY THE SCIENTIST: A STORY OF DISCOVERY

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In 1998, a staff writer from the University of Wisconsin contacted me and asked if I could review her write-up on Joe Hickey for a special anniversary issue celebrating the Department of Wildlife Ecology at UW—that department established by Aldo Leopold himself. And in fact, I have been proud through my career to be the “academic son” of Joe Hickey and the “academic grandson” of Aldo Leopold—quite a lineage that I had stepped into, almost randomly, but not quite. I had gone to Wisconsin specifically because of Joe Hickey (for one thing, I liked his book, *A guide to bird watching* because of its scientific, field-oriented approach).

On this deal, I was late in getting my comments to this reporter just a bit like I was late in commenting in publication about Joe after his death—a bit of having too much to do but more than that, a bit (or should I say a lot) of uncomfortable avoidance. I imagine that part of my procrastination to put this off was because it always made me a little uneasy to have to summarize this man, Joe Hickey, in part because I never really accepted his death or even before that, his deterioration with age. Yes, in the last years of Joe’s life, I was busy “paving my own roads” and did not see him as much as when I had first left Wisconsin. He expected and understood that it would be that way; he had probably done the same in his own life. Although I kept in close contact with Joe for many years after I left Wisconsin, I think I avoided that later frequent contact when I saw that his mind began to deteriorate and he wasn’t that same vibrant person I knew. In fact, I always felt that Lola, his second wife, had even tried to protect Joe, too, by not insisting that I (or other past associates) come in to see him in his last year of life, and, in fact, perhaps also even gently keeping us away—she did not want friends to see him that way any more than we wanted to see him go downhill so fast. Perhaps he would not have recognized me and our past associations, so it gives me some selfish relief, as well, that I did not have to experience this. But here’s what I told the reporter.

“One can only say so much in a small amount of space, so let me provide just two general areas of comment that may help provide you some more insight for the short description you have been allotted. Again, I was being the “straight to business” person.

Regarding "Banning DDT" and what Hickey is "best-known" for, I would say that Joe was really best known, scientifically, for at least two things rather than just one: (1) his pioneering analysis of avian population dynamics (1952, *Survival studies of banded birds*) which held as a "classic" for at least 2-3 decades, and still has great use. He was famous for this, and rightfully so. It was one other reason I was attracted to Joe as my major professor. He was an early "authority" in the area of population dynamics and analysis in birds. And in this light, I think Joe's hero was David Lack, who he knew personally.

Then regarding Joe's long-term research on the impacts of pesticides, it took an already well-

known and well-respected scientist further along that road (most notably for his work on the "hard core" organochlorines, eventually centering on DDT's persistent metabolite, DDE, for the eggshell work). But he was also leading in the field of "wildlife pollution ecology" at the time in hypothesizing (and then carefully documenting) large-scale bird declines (look at his *Wilson Bulletin* paper on Midwest bird populations) due to OC use, much of it relating to direct mortality of birds. Those were the days of "spray/count." Joe was right there alongside Rachel Carson, Bob Rudd, and Lucille Stickel; these were all people he knew personally from his visits to Patuxent and elsewhere.

And regarding the link between robins and peregrines. You are right on that through go there is that real link. But, at the time of "the" conference, eggshell thinning was not yet known, mostly just the very alarming and rapid population declines of the peregrine and their unusual behaviors, literally everywhere in the bird-world, world-wide! Hickey was concerned about population biology and went into the conference with an open mind to many, many potential causes, among them OCs. There were no foregone conclusions at the time of the conference. One of Joe's trademarks as a scientist was that he was extremely open-minded and objective, although he was often attacked for this by scientists with stronger "clout" but far less objectivity. **This is often called "transference".**

And Joe was noted and well-regarded for his restrained and "cool" behavior. He once told me a story of where, once and only once, his coolness had broken down (I think he later felt more guilt about using a bad word than telling somebody off). It was after some testimony on the ill population effects of organochlorine pesticides where a well-known witness (some industry witness named Don Spencer, I think) had made all kinds of flimsy assertions on stand, literally about how bird populations had actually increased in the world after the introduction of OC pesticides (the approach has since culminated in an almost routine attack on science by proponents of potentially ill-causing industries and their activities—just read the books *Strategic Ignorance* and *The Republican War on Science* for the culmination of such an approach in the 2000s, but that's another story). Joe, much more of a bird population expert than this guy could ever hope to be, listened to all of them, even this guy, who emulated a most deplorable misuse and twisting of data. In the halls later that day, however, they met. Spencer came up and said: "whadda ya think about that, Joe?" "You are full of shit," he said, and walked off.

But at the peregrine conference, egg breakage was mentioned as one of many factors that needed to be considered in evaluating worldwide peregrine population declines. Derek Ratcliffe went away from this conference with this on his mind and then had a talk with an English egg-collector, D. Nedersole-Thomson, who suggested that Ratcliffe take a look at eggs in collections. That's when it was first known that the eggshells themselves were affected, along with, of course, the females that laid those eggs. Ratcliffe devised an eggshell "thickness index" because he couldn't directly measure thickness; and he reported his astounding results to Hickey even before he went to press. Ratcliffe and Hickey were friends and were on the phone often. I was "just" a graduate student at the time, and Hickey literally grabbed my hand one day and dragged me over to the engineering department where we talked to an

engineer/technician (wish I could remember his name right now, but I can't). Joe said we need "this" and "this" and "that." Several weeks later, our engineer had a perfect little device ready for us to take and use; and it could measure eggshell thickness through those tiny holes our peculiar egg-collectors made.

Then Joe and I argued about what I was to do, go to the museums and measure thousands of eggs (his emphasis) or go into the field and sample eggs from populations with different exposure levels of insecticide (my emphasis). Actually, Joe ended-up letting me do both things, with a lot of help from his extensive network in the ornithological world. He basically put me "on the case," with the advantage of the many, many good ornithological colleagues he had developed over the years; and Joe let me freely snoop around for data and expand our network of contacts, doing all of the traveling and sleuthing myself. I found out through experience that egg-collectors were a very curious bunch, and Joe knew it, too. I had to gain their confidences, among other things, because many of them had collected eggs illegally. Joe sent me out to crack into that "egg." We were in very close touch nearly every day on the phone.

One night when I first discovered the fact of eggshell thinning in California peregrines early in my travels at the then private egg collection in Los Angeles, the Western Foundation for Vertebrate Zoology (just as Ratcliffe must have done earlier with British peregrine eggs), I called Joe with the good news, put my data away, and then went out for a drink to celebrate in one of the local bars near UCLA. That night, some crazy SOB that I was drinking with, pulled a loaded .45 out and began to wave it about, threatening everybody in the bar. For a brief moment I thought that our monumental discovery and data were going to die right there on the barroom floor—that's all I could think about, THE DATA. Fortunately, the bartender and I talked this "lunatic" down (somehow he had grown to trust me over the evening as I listened to his lamentations about the wife he had tracked from Michigan west to California to kill—perhaps he had trusted me in the same way that those egg collectors with illegal eggs had). The police finally came and took him away sobbing. I am sure that I never told this story to Joe, although I told him nearly everything else from my trips! I didn't want him to get worried and cut my trips short; and on that project, I ended up visiting nearly every major museum in North America. One travel agent in Madison bragged to Joe and me once that the largest ticket ever written by his agency was written for my "eggshell travels."

In working with Joe over the years, he and both of his wives (Peggy and Lola—he knew how to pick a woman; both of us got lucky on that account!) also became very good friends of mine, and I considered Joe much as an adopted father, a good friend, and even drinking buddy. For example, he and I were "hard core" Packer fans and to this day I remain loyal to Green Bay, largely because of Joe. All this just to give you a feeling that Joe was a real "people's-person" and friend as much as he was such a great scientist.

Back to the little history of the "peregrine conference" (from my view of course). I think that the conference was a pivotal policy "coup" and the major impetus for the eventual discovery of eggshell thinning and its causes that came later, and then also a big "nail in the DDT coffin"

itself. Joe, however, did lament to me once that it was not the ecotoxicological effects of DDE (because basically few people in society really gave a damn about wildlife conservation) that had the most influence, but rather the connections to human cancer (because what people really fear, something more personal). But that's what Joe's conference stimulated, the ecotoxicological findings (the connections between molecule, the individual physiology, and the ultimate demographic phenomenon). Eventually came the DDT hearings and the ban of DDT in Wisconsin that I think led to a major ban all over the US.

The major discovery of DDE-induced eggshell thinning actually came in what I see as four steps. First it was the impetus for further inquiry along with many relevant ideas, hypotheses, and observations (unusual behavior, egg-breakage and egg-eating, mysterious deaths, etc.) from the world body of peregrine (and other) experts--all organized and brought-together by Joe. Second, the observation of eggshell thinning in samples of bird eggs of raptors and then many different bird species over a critical time period of observation, time-coincident with the post WWII introductions of OCs, radioactive contamination, etc., was another direct result. Derek Ratcliffe, Joe and I, and others all hypothesized that OCs were somehow related to these eggshell problems, but for awhile there weren't any direct connections. A third step, then, involved a hypothesis that DDT (really DDE) was more specifically the major cause of eggshell thinning and that this eggshell thinning was variously related to population decline. This was first done by Hickey and Anderson in 1975. A final, critical step, then, came with the testing of this hypothesis under controlled feeding experiments (the earliest work was done at Patuxent under the direction of Lucille Stickel; she and Joe Hickey were also good friends and colleagues). Lucille had the leadership, insight, and command of necessary resources for the critical experiments at Patuxent, a laboratory operated by the U.S. Fish and Wildlife Service. Bob Risebrough and I also conducted some of the critical experiments, in my front yard on the north shore of Lake Mendota, Wisconsin and then later in Davis, California, the site of my new job with the USFWS, having been hired by Jim Keith (we could never do this today, given the many new regulations regarding animal welfare--I am not saying they are bad, however). And then, Risebrough also came to our rescue with some innovative chemistry when it was discovered by a Swedish researcher that PCBs were universally present and did interfere with many of the other OC analyses, especially the insecticides and their metabolites. But to add "further frosting on our cake", Lucille Stickel, in confidence (because Patuxent had just spent thousands on a new GC/MS system for analytical confirmations and hadn't yet published residue data from their own programs at that point in time), also provided Joe and I with a small number of critical backup confirmations to our DDE data, so as to cover our back-sides if we were ever asked--even before we went to press, but we were never asked. Thus, when we actually went forward, we were much more secure in our results, and we were ready to "fire back" if we were challenged. We couldn't say or print anything, but knew, thanks to Lucille and her chemists, that we were correct in what we were saying about those residues. I learned so much from all those people.

So, the point, I guess, is that Hickey himself actually did play a pivotal role in starting this particular chain of events, although something this complex and multi-factorial always has a

multitude of people involved, just like the Green Bay Packers Joe and I loved so much. We had so many friends and colleagues working-with and helping us.

So some of these details might help you put a better perspective onto Joe's big role in several important fields. In general, what I think I am trying to get across here is that Joe was well-known for more than pesticide ecology (i. e., he was also an internationally recognized ecologist and ornithologist); and, that he was quite a personable and very objective fellow, who freely shared his ideas with others (and they with him); and was a true friend to all his colleagues. He was one hell of an example to follow! Right up there with Rachel Carson and Aldo Leopold!"