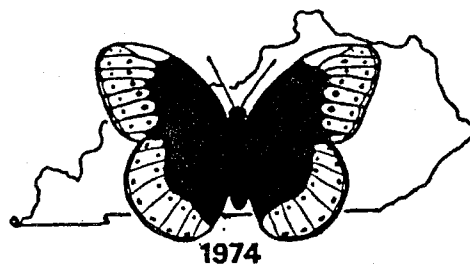


KENTUCKY LEPIDOPTERIST

NEWSLETTER OF

The Society of Kentucky Lepidopterists



1974

VOL. 14, NO. 3

M. L. McInnis, Editor

July, 1988

THE CATERPILLAR KID AND THE RETIRED PROFESSOR

Carol Watson

David lumbered into my sixth grade classroom this fall bearing his gifts of nature tucked into pockets, coffee cans, jars, and knapsack. His stocky, robust build, dark, curly hair, and inquisitive eyes danced behind his metal glasses. His enthusiasm radiated as he unveiled his priceless treasures on his desk. Caterpillars! Like the magician out of "The Sorcerer's Apprentice," David produced more and more of the fuzzy little creatures, all sizes, shapes, and colors. They wiggled and chewed. Each variety of the little silent munching machines preferred a different species of leaf that David brought forth from some unique storage place. Some of these comical creatures spun cocoons while one little fella, as David pointed out, just built his stabilizer belt.

My first reaction was, "Oh, here's just another kid who is captivated by crawly things." I invited David to share his impressive collection with the rest of the class. What I figured to be a 10-minute show-and-tell session turned out to be an hour's worth of the most informative lecture on caterpillars, cocoons, and butterflies I have ever heard. In fascination, I watched this miniature science professor rattle off information about the Lepidoptera world that was only found among the learned

men of entomology. Not only had he captivated his fellow students, he used great humor and teaching gestures that far surpassed his young years. He strutted around the front of the room, one hand stuck in his pocket, while the other hand clenched a piece of chalk. With brilliant timing, he used the blackboard for illustrations. With assorted specimens all lined up on a display table, he handled, stroked, caressed, and displayed each caterpillar with fatherly pride. I, too, was captivated. Our roles reversed as I became the student and David became the teacher. He did not come across as a know-it-all who showed off. It was obvious he thoroughly loved what he studied and sincerely enjoyed sharing his knowledge with others.

After his lecture, I asked David how he had acquired so much knowledge about this subject. He chuckled and replied that it was his fanatical passion and that, for years, his bedroom was stocked like canning jars from floor to ceiling with moths, butterflies, cocoons, or anything else associated with the winged wonders. He said that all the silky cases strewn around captured the thrilling suspense of a cocoon heaven and that he never knew what sudden surprises might break forth into light. Much to his parents' objections, he kept cocoons in the refrigerator. He studied, observed, collected, and theorized over these

miracles of nature for hours a day. Here, I mused, is an example of self-learning and self-motivation -- probably the greatest assets a brilliant person could have.

On one hand, I realized as an educator that, if handled correctly, this child could blossom into an Einstein of the natural sciences. On the other hand, the development of kids like these is often thwarted by passive adults. I needed some kind of positive action to keep David's enthusiastic light from being extinguished.

So, I contacted the Ohio Agriculture Research and Development Center. The entomology professors individually posted a stiff fee for class visitation, and our school budget was tight. I managed to learn of Dr. Roy Rings, a retired entomology professor on staff who specialized in Lepidoptera. On a whim, I suggested to David to phone this professor personally and express his intense interest in this man's field of study. "Let him know how knowledgeable you are," I advised. "Once you have introduced yourself and discussed your mutual interest, offer to help him for no pay, cleaning up, doing simple job tasks. Just to be around his entomology lab. The chances of your getting accepted are slim, but, nevertheless, it wouldn't hurt to try. All the professor can say is 'No.'"

As I prepared an excited but nervous kid on how to state his request, I left David cracking his knuckles in the empty school office beside the telephone. Playground duty awaited me. Thirty minutes later, out of the school building bounded the most joyous expression of happiness ever seen on a kid's face. It was Christmas, fireworks, cotton candy, and birthdays all rolled into one big smile. As David stuffed his baggy shirt into his pants and hopped up and down, his infectious grin told me everything. "What a conversation!" David said. "We exchanged tons of information about the

Lepidoptera, and I kept right up with him until he lost me in some Latin terminology." He did a jig and squealed with delight. "I can't believe this, but Dr. Rings invited me to spend Saturday afternoon with him at his laboratory." He hugged me and chanted, "Thank you, thank you, thank you!" With a swelling heart and an almost disbelief at David's luck, I mumbled something like, "It's the keen spirit that seizes worthy opportunities." For the rest of the week, David's excitement was uncontainable.

On Monday morning, I anxiously awaited David's report on the weekend's event. Breathlessly, he dashed into the classroom, throwing his hands up, exclaiming, "What a day! What a day! Dr. Rings is the neatest man I have ever met, and can you believe it? He invited me to work with him every Saturday afternoon. It's like being a butterfly apprentice." All the classmates fluttered around to hear the good news. I was numb yet overjoyed for this prize student. David went on to describe his exciting afternoon with the professor. A world traveler and lecturer, Dr. Rings showed David his magnificent collection of butterflies from every continent. With eyes dilated and faculties energized, David explained to his mesmerized classmates every new piece of scientific information he learned on Saturday. Sitting in a circle on the floor, David reminded me of Socrates under an olive tree. He was nonstop talk, barely coming up for a breath of air, eyes dancing and hands in perpetual motion. His classmates were all ears. I was on the outside looking in on this educational rapture.

For the next 8 weeks, David reported in every Monday, detailing what he had learned with his new friend and teacher. Each Monday brought tales of newer and more exciting adventures. He described an excursion into a highpowered microscope that viewed powerful mandibles chopping away on

green leaves. Dr. Rings lent David study material and quizzed him each week. David loved the challenge. His school desk reminded me of examination time in college -- books, papers, and note papers scattered everywhere. Sometimes, I caught him absorbed in his butterflies when he should have been doing a spelling assignment. One Saturday, the two butterfly collectors spent 6 hours in the woods jarring tree limbs, trying to knock down caterpillars. A large plump worm was knocked senseless, and the professor did not hesitate to demonstrate how to preserve it. David proudly exhibited this fine emerald specimen to his classmates. Another Saturday, he tagged along to a Columbus museum while Dr. Rings rummaged through old insect records. At first, I thought the entire affair would eventually wear off, but, with each weekend, the friendship between David and the professor gained in strength and intensity.

At a parent-teacher conference, David's mother told me about a day that will always remain special to her. she said, "David was supposed to be at the research center this afternoon with Dr. Rings. I was working in my old clothes, piling laundry in the basement. I heard a loud bang of the back screen door. David's voice echoed through the house: 'Hey, Mom, Dr. Rings and I came to collect specimens. I told him about our pond in the backyard, and he said that butterflies like to gather around areas of water to sip moisture. So here we are.' They both grinned from ear to ear, looking like a comedy team that had just finished their hilarious act on stage and were waiting for the applause. I nervously shook the professor's hand, somewhat embarrassed at the array of things in the house. The two naturalists did not seem to notice the mess. Before I offered Dr. Rings some coffee, they disappeared out the garage door, laden down with butterfly nets and other various scientific equipment. You would have thought they were on a safari in Africa.

"Somewhat awed by our son's new status, my husband and I sheepishly peeked out the back kitchen window and witnessed a scene not often played out. The fall stage set against one of those special blue skies had the sun merrymaking off the pond. The two actors, a 12-year-old boy and a 70-year-old retired science professor, leaped and pirouetted after fluttering colors that lured them here, there, and everywhere. The butterfly nets added to the graceful movement as though it were choreographed by Mother Nature herself. The wings on their feet almost matched the wings on the insects. Their shouts of elation and glee resembled the last day of school at 4:00 when the doors burst open. 'Hey, David, I caught a beauty! Here! Wow!' 'Dr. Rings, I've never seen that coloration on wings before. Whahoo! Look at that one. Let's get him!' The electric charge between the players and the butterflies resulted in the actors being totally engulfed in a truly magnificent obsession of the wonderful world of the winged. They were two humans who easily crossed a 50-year generation gap in a mutual bond of endless discovery. My husband's final comment as he squeezed my hand was, 'Our son has found someone else made from the same mold. God left the beaten path when he created those two. Isn't it a wonder in all the universe that they have found each other?'" David's mother went on and explained that, since that day, the professor had become an adopted member of the family and was pressing an indelible seal on her young son's life.

The following month, our school held an open house. David informed me that he invited Dr. Rings to be his guest. I did not take David seriously. What renowned doctor of the sciences and world traveler would take the time to come to a small rural school open house? Besides, the weather was bad, with a chilling sleeting rain. But later that evening, as I entered the classroom, there sat Dr. Rings at David's desk. I first noticed his long

gangling legs sticking out from under the school desk. David sat right next to him and grinned. Anxiously, he introduced me to the distinguished Dr. Rings. I was instantly put at ease with his lively and charming smile. I was impressed with his manicured attire and thick wavy white hair. Behind his studious looking glasses peeked twinkling eyes full of mischief and adventure. They seemed to match David's. They looked and laughed at each other as if a secret joke was being played upon the teacher. Dr. Rings' fashionable tweed coat, white shirt, and silk, polka dot tie made him stand out among the people of the farming community.

After a short teacher presentation, everyone was summoned to the school cafeteria for punch and cookies. Dr. Rings did not have to say he was enjoying himself. He moved freely among parents, students, and teachers as though he were native to the territory. David flitted around the professor's side like a gnat around a shining lamppost.

After I moved around to hostess visitors, I finally edged over to get to know this one-of-a-kind educator who made such a crucial impact on my student. We sat at the cafeteria table, nibbled refreshments, and chatted as easily as neighbors having coffee. The professor proved a fascinating conversationalist and talked about his work, his travels, and his lectures. I finally moved to the question about which I was most interested. What motivated him to take such a dedicated interest in David? His reply was simple but eloquent. "The reasons I took David in as a friend and student are not as admirable as you think. First of all, David is a very gifted student with an insatiable thirst to study in my specialized field. He is easy to teach. Second, I see David as I was at that age, and it is as if I am going back in time with myself. I did not have a master of the insect science to enlighten me. Through David, I am

reliving the fun, frolic, and friendship I would have loved to have had when I was young. Plus, there is nothing like the friendship of an enthusiastic wide-eyed youth to bring out the best in these old bones. I am seeing the wonderful world again through his youthful eyes (and my cataracts are not doing so well these days). The last reason is somewhat selfish. David idolizes me." With his chest puffed out and with a sheepish grin, the professor boasted, "I love it! It feeds my ego!" We ended the conversation as David wedged between us, looped his arms between me, his teacher, and the retired professor, his idol. "Hasn't this been a super evening!" David's face beamed like a beacon.

Six months have passed since the "Caterpillar Kid" found his retired professor. They are still going at it full force every weekend except when Dr. Rings leaves for trips to Africa, South America, or wherever. Even then, he always surprises David with a souvenir of an autographed Lepidoptera book or a prized butterfly specimen. David's potential abilities are unfolding in a way that the regular classroom experience could not begin to release. His life has been given the winning edge.

Where will great friendship end? Probably into the next life if there are butterflies in heaven because, surely, the Caterpillar Kid and the retired professor reach over the threshold of time.

[Editor's Note: This article was reproduced in its entirety from the March/April, 1988 issue of GCT. It provides both a fascinating profile of our current President, Roy Rings, and a touching remembrance of the manner in which many of us had our interest in Lepidoptera nourished.]

HENRY WALTER BATES' CONTRIBUTION TO
DARWINISM: A Theory of Mimicry

Troy Payne

Henry Walter Bates was a nineteenth century naturalist and a close friend of both Charles Darwin and Alfred Wallace. An avid entomologist, he scoured the woods of Charnwood Forest near his home in Leicester, England. He could only pursue his entomological interests, however, when he was not hard at work manufacturing hosiery, which he did to make a living. He wrote many short papers on insects while he was working in the hosiery mill and even after he had left the mill to become a clerk in nearby Burton-on-Trent. He disliked bookkeeping and business and spent more and more of his time walking through the woodlands of southern England looking for insects and studying natural history.

In 1845 Bates met Alfred Wallace, who was then the English master at the Collegiate School in Leicester. Wallace, at that time, was primarily interested in botany, but was intrigued by the intricacies of the insect world that Bates showed him. At the time they met, Wallace was twenty-two years old and Bates was twenty. They naturally became good friends and often collected together. Wallace became particularly interested in the Coleoptera (beetles). Wallace wrote, "I also learnt from him [Bates] in what an infinite variety of places beetles may be found, while some may be collected year round, so I at once, determined to begin collecting, as I did not find a great many new plants about Leicester" (Brooks, Just Before the Origin, p.6).

Wallace moved from Leicester in 1845 but continued to correspond and exchange specimens with Bates. In 1847, Wallace proposed a trip to the tropical jungles of the Amazon River to collect specimens, ship them home, and gather facts towards solving the problem of the origin of species. Wallace and Bates had each read the then new and famous

book by William H. Edwards entitled Voyage Up The River Amazon, Including a Resident at Para' which had been written in 1847. Bates and Wallace corresponded with Edwards and with Edward Doubleday, who was a curator at the British Museum. There Bates and Wallace studied specimens of plants and insects, included some new species of butterflies from Para' (which is now Belem), Brazil. With encouragement from Edwards and Doubleday, arrangements were made and the two naturalists arrived in Brazil on May 28, 1848. They collected together for almost a year and then split up in order to cover more territory. Wallace stayed in Brazil for four years and returned to England. Bates stayed in Brazil, traveling up and down the Amazon for eleven years. In all those years, he never strayed more than four degrees from the equator. Bates and Wallace traveled from Para' up the Tocantins River to Santarem, which was Bates' headquarters for three years. They traveled to the confluence of the Amazon and the Rio Negro at Manaus where Wallace decided to travel up the Rio Negro. Bates explored the Tapajos and Solimoes river basins for the next seven years. His main camp was at Ega (Tefe) at the foot of the Andes, eighteen hundred miles from the Amazon basin. Here he worked until 1859, when his chronic bad health forced him back to England. While he was in Brazil, he collected in excess of 14,712 species, eight thousand of which were totally new to science. For all his efforts, he had constant trouble finding monetary support and ended up receiving only about eight hundred pounds for his eleven years of work (McKinney, "Bates, Henry Walter," p.501).

When he arrived home, he began to sort his enormous collection. Having become quite a taxonomist, he was thrilled to read Charles Darwin's On the Origin of Species by Means of Natural Selection, which was published in the summer of 1859. He instantly became a convert to Darwinism.

Bates, however, had been an evolutionist long before he was a Darwinist. Wallace and he spent much time discussing the subject of the origin of species. Wallace had been a little more radical than Bates. Wallace had quickly endorsed the theories of Robert Chambers in his heretical book, Vestiges of the Natural History of Creation, whereas Bates thought Chambers had made several generalizations that were too hasty. When Wallace wrote his paper, "On the Law Which has Regulated the Introduction of New Species" in 1855, Bates was taken aback, because it was almost as heretical as Chambers' book. Wallace's paper laid the groundwork for the idea that every species has arisen "coincident in both space and time with a pre-existing closely allied species." (Wallace, "On the Law...", pp. 184-196). Creation was something that occurred under natural laws and not subject to some special creation of God. Bates considered the matter and determined that Wallace was correct. In fact, Bates wrote to Wallace, "the theory I quite assent to, and, you know, was conceived by me also, but I profess that I could not have propounded it with so much force and completeness" (McKinney, "Bates, Henry Walter," p.502). Wallace and Bates spent four years of their lives together in the jungles of Brazil. It is incomprehensible that their philosophies did not affect one another. One can only imagine what conversations these two Englishmen must have had in the depths of the jungle of Brazil.

While Bates was sorting through his specimens at home, he found increasing proof that certain insects mimicked other insects. He was not the first to notice that some insects looked like others, even if they belonged to phylogenetically distinct lines. MacLeay had noted in 1821 that certain Diptera (flies) looked like Hymenoptera (bees and wasps) and explained this by the principle of Analogy as opposed to that of Affinity in Nature (Poulton, "Natural Selection...", p. 40). Boisduval had described in 1836 an

African swallowtail butterfly that was copied by several other butterflies of different families. Kirby and Spense had in 1817 described that the flies of the genus Volucella have a remarkable resemblance to the bees which they parasitize. They had concluded that the disguise allowed the flies protection from the bees. In general, it was thought that any sort of resemblance between species was simply due to the marvelous handiwork of God and pointed to the orderliness of the world.

It was Bates that first described "mimicry" and gave an explanation of the phenomenon. According to Cott, "In Batesian mimicry a relatively scarce, palatable, and unprotected species resembles an abundant, relatively unpalatable or well-protected species and so becomes disguised" (Cott, Adaptive Coloration in Animals, p. 398). Bates' theory is buried in his monumental article of 1862 entitled, "Contributions to the Insect Fauna of the Amazon Valley. Lepidoptera: Heliconidae." This article was written to redefine and explain some patterns of resemblance in heliconid butterflies. There are two families of insects that looked so much alike that they were considered as one family until Bates split them. What Bates called Danoid Heliconians are now known as butterflies in the family Heliconidae. Those that he named as Acraeoid Heliconians are now known as the family Ithomiidae. The species of these two families are unpalatable because of the chemicals that are in the leaves of the plants that the butterflies eat in the larval stage, i.e., as a caterpillar. These species often have cardio-glucosides in their tissues that are not only unpalatable, but have an emetic effect on anything that eats them. Bates, however, knew nothing of the chemistry of the leaves or the butterflies and had to rely on field work to secure his theories.

There are other types of mimicry that Bates listed that are not

considered as comprising Batesian mimics. Various beetles, spiders, and flies mimic ants. Many moths and longicorn beetles mimic bees and wasps. Many moths have wings that perfectly match the vegetation on which they sit. Camouflage is common among insects and is helpful in escaping predation. Bates found a large caterpillar (probably a Papilionidae or a Notodontidae) that for all the world resembled a viper. Many butterflies have eye-spots to scare away predators. Although these are all marvelous things, Bates focused on his Heliconoid butterflies and using them, provided a proof for Natural Selection.

About mimicry, Bates wrote, "Mimetic analogies, it is scarcely necessary to observe, are resemblances in external appearance, shapes, and colors between members of widely distinct families; an idea of what is meant may be formed by supposing a pigeon to exist with the general figure and plumage of a hawk" (Bates, "Contributions...", p. 502). The mimicry even fooled Bates. He commented that it was hard for him to distinguish between the members of the genus Leptalis (which is in the family Pieridae) and the members of the genus Ithomia (which is in the family Pieridae). The model and the mimic fly together and look so closely alike that even experts find them hard to differentiate. How did Bates find out which was the mimic and which was the model? The model had an overall appearance that was similar to others of its family, whereas the mimic looked markedly different than others in its family. Thus, in the above example, a Leptalis butterfly has no superficial resemblance to members of its own family. It stands out alone from its family in overall appearance. Structurally, a Leptalis gives itself away, because the wing vein structure and the genitalia show that it is in the family Pieridae even though it superficially looks like a member of the genus Ithomia, all of which look quite alike.

Others had noticed mimetic resemblance, some of whom have been mentioned, but none attempted an explanation as to their cause, except it being due to the magnificent handiwork of God. Bates, however, knew he had found his answer in Darwin's Origin. The answer was simple natural selection. Bates knew that physical conditions could not purely give such varieties, because in limited districts, where conditions were the same, the most widely contrasted varieties were found coexisting together. Such diversity could not be caused in such similar habitats. He also threw out the ideas that "sports" could have caused such variation. A sport from one generation could not cause all the distinct varieties seen changing every few miles up the river. The only answer was natural selection. Insectivorous animals, such as lizards and birds, selectively destroyed those original Leptalis species that looked most unlike the unpalatable Ithomias. Those Leptalis species that looked most like the Ithomias were not eaten and were able to breed, producing more Leptalis offspring that looked more like Ithomias. The more closely the mimic resembled the model, the better chance it had of surviving and producing offspring. "Thus, although we are unable to watch the process of formation of a new race as it occurs in time, we can see it, as it were, at one glance, by tracing the chances a species is simultaneously undergoing in different parts of the areas of distribution" (Bates, "Contributions...", pp. 512-513). Bates wrote, "Such, I conceive, is the only way in which the origin of mimetic species can be explained. I believe the case offers a most beautiful proof of the theory of natural selection. It also shows that a new adaptation, or the formation of a new species, is not effected by great and sudden changes, but by numerous small steps of natural variation and selection" (Bates, "Contributions...", p. 513). He comprised a chart of mimetic analogies from his research that showed mimetic

relationships between certain insects as phylogenetically far apart as hawks and pigeons.

Bates knew nothing of the biochemical makeup of the distasteful Heliconians and Ithomiads. To back up his theory, he used years of observation in Brazil. He had to solve two problems. Why are the Heliconidae and Ithomiadaea, which are both very colorful and slow moving, mimicked more than any other family of butterfly? And, why does mimicry happen in insects so much more often than in other animals? The answer to these questions was of great import.

Bates saw that there was nothing apparent in the insect's habits or structure that made it immune from bird attacks. In fact, these Ithomiads and Heliconians flew in the sunlight in wide open spaces viewable by all creatures. They even seem to put themselves into danger, for not only did they refuse to hide in the woods during the day, but they flew exceedingly slow, so that it seemed that any bird could scoop down and eat one. However, birds did not eat members of these families. Bates therefore concluded, "it is probable that they are unpalatable to insect enemies. Some of them have exsertile glands near the arms [sic - legs], which are protruded when the insects are rough handled; it is well known that similar organs in other families secrete fetid liquids or gases, and serve as a protection of the species" (Bates, "Contributions...", p. 510). It was not until 1869 that someone methodically tested different birds' tastes for caterpillars and for adult Lepidoptera (Weir, "On Insects and Insectivorous Birds"). All insects must be dried before they can be stored in a collection. During the drying process, it is possible to have insect pests come and eat the specimens. Bates commented that when he dried his specimens, the Heliconians and Ithomiads were never touched, even though species from other families drying right next to them would be eaten. He also noted that

Heliconians and Ithomiads had a certain scent about them when they were drying that other species did not have (Bates, "Contributions...", p. 510). Wallace and Trimen later added to this observation. Wallace found the same odor proceeding from drying Euploea in the Malay Archipelago and Trimen found the odor in African specimens of Danais and Acraea (Trimen, "On Some Remarkable Mimetic Analogies...", p. 498). Thus, though their chemistry was not up to snuff, their noses were, for they found the genera that have an unpalatable taste to birds by their disagreeable smell upon drying.

The answer to the second question was more speculative and had less empirical answers. Bates thought that insects had perhaps attained a higher degree of specialization than most other classes, and believed that this could be shown by the perfection of their adaptive structures and instincts. Mimicry could be found more in the tropics than in temperate areas because of their sheer numbers in tropics and therefore, because of the increased competition that the numbers caused. Wallace noted that mimicry could be found in other classes in his article "Mimicry, and Other Protective Resemblances Among Animals" (1865). He noted that mimicry does occur among birds and even in one mammal, nevertheless, it is not nearly so common as in insects (Wallace, My Life..., p. 407). It was not until 1914 that Shelford listed pairs of unpalatable tree-shrews and palatable squirrels as Batesian mimics (Wickler, p. 18).

Bates never solved two problems. He had noticed that the models often looked very similar amongst themselves. These models often mimic each other. Bates had no suitable explanation for this and neither did Wallace. It was left up to Fritz Muller to puzzle this out. Muller determined that a predator, such as a bird, had to learn that a butterfly was distasteful. A young bird could more easily learn to

workshop and field trips, with moderate collecting success. Tom Emmel, Boyce Drummond, and F. Martin Brown gave enjoyable and informative talks, too. After that, Charlie and Troy collected in southern New Mexico and Arizona, meeting a number of area collectors and scientists such as Noel McFarland, Peter Jump, Ray Nagle, John Wilson, and John Palting. Spots visited included Garden, Guadalupe, Montosa, and Madera canyons in Arizona, and Mountainair, New Mexico. Success was moderate as the moon waxed, but Charlie was rewarded with a single male Neophasia terlootii in Madera Canyon, and at least six sterrhine geometrid species he had not collected before, and ova for rearing from some. He will be teaching summer school for the rest of the summer, and Troy begins medical school in early August.

Charlie Covell also wandered into a marijuana plantation on National Forest land in Menifee County. Extreme care should be exercised when visiting National Forests in areas where this plant is known to be cultivated.

NEW MEMBERS

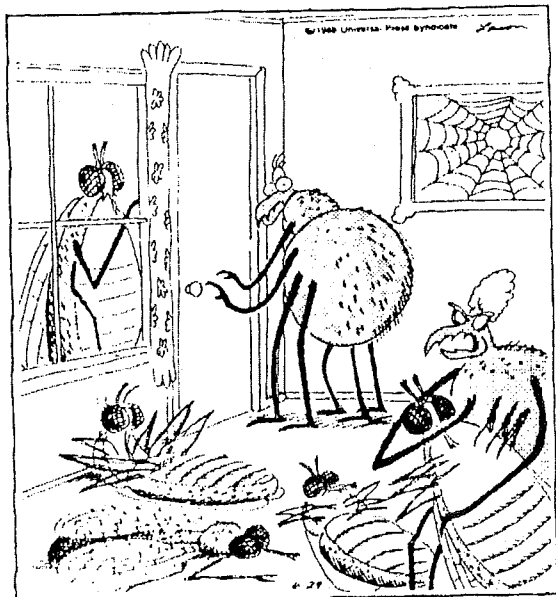
Kenneth L. Helfgott
6 Berkley Place
Smithtown, NY 11787

Kathy A. Miktuk
385 Redding Road
#152
Lexington, KY 40502

NEW ADDRESSES

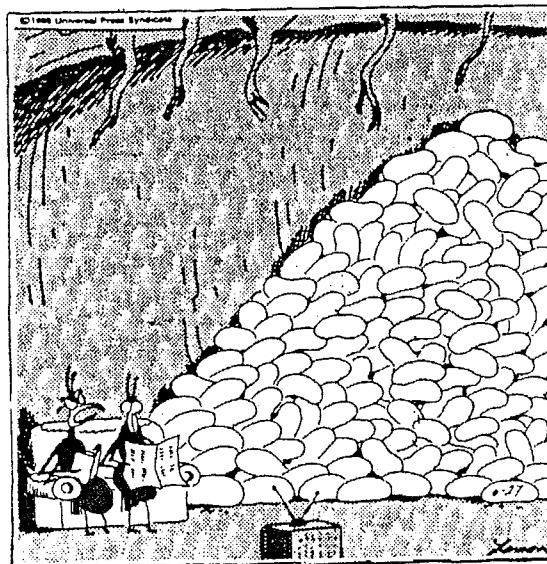
Harry Pavulaan
189 Clarissa Drive
Bay Shore, NY 11706

THE FAR SIDE

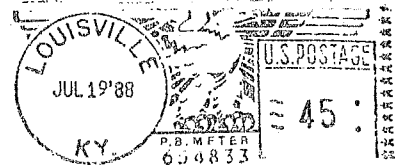


"Wait, you idiot! Let me first get rid of these exoskeletons!"

THE FAR SIDE



"You know, Vern...the thought of what this place is gonna look like in about a week just gives me the creeps."



THE KENTUCKY LEPIDOPTERIST
M. L. McInnis, Editor
22 Benchmark
New Albany, Indiana 47150

FIRST CLASS

Loran D. Gibson
8496 Pheasant Drive
Florence, KY 41042
pd88
