

July / August 2001

The Big Move

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The Big Move

As UC Davis continues to progress into the future, major emphasis in the College of Agriculture and Environmental Sciences is shifting away from classical agricultural production research to more advanced studies in molecular genetics.

There has been a huge increase in the number of molecular geneticists on campus, and they need room to work. If you have been on campus, and seen Briggs Hall, my old campus home, you might not now recognize the building. To house the geneticists, a very large Life Sciences Annex was built onto Briggs Hall.

Unfortunately, the Annex was not large enough to house all the geneticists, so the Cellular and Molecular Biology (CMB) faculty convinced the Dean that they needed adjacent portions of Briggs Hall, including the space occupied by me, my Staff Research Associate (SRA), and my mini-lab. So, I was required to move to the Laidlaw Bee Research Facility. The CMB people paid for the move.

Since I was being moved away from the mini-lab, I said that I would need one in the Laidlaw Facility. They said OK; just tell us what you need. The list was a bit lengthy, but here is a quick peek: 1. cut off some bench in Room 116 (my new home in the Laidlaw Facility), to make room for filing cabinets, 2. move overhead cabinetry from Briggs to my new office, 3. tear out the wall of one of the existing labs to increase the size of the Multi-purpose Room (led to tile floor, zoned lighting, a new projection screen, a drop ceiling, and handicapped accessible rest rooms and ramps to the outer doors), 4. convert the foyer into a reception area and office for my SRA, 5. tear out another wall between two small labs and put in a good, new lab (it has a tile floor, drop ceiling, new fume hood, and required the sewer line to be run out to the building and hooked up), 6. a request to refrigerate the comb storage chambers (used to be methyl bromide fumigation chambers) led to having the most decrepit chamber replaced by a large walk-in freezer (wax moth control), and 7. a request for more

electricity to a central room for refrigerators and freezers led to a new power pole with three new transformers (also, new power line casings and switch boxes, and a significant air conditioning unit to keep the appliance room cooled against all the heat from the compressors and CA summers).

When most of this was about three-quarters finished, I moved out here in early July. Since then, I have been on vacation, to the WAS Conference, and had an enjoyable visitor from the New Zealand Ministry of Agriculture and Food who is trying to determine how his country and beekeepers should be dealing with recently introduced and rapidly spreading *Varroa* mites and American foul-brood. Thus, my office still is a shambles and everything that I seem to need is still hiding in boxes.

Currently, all my address, telephone, FAX, etc. information is the same as it ever was. However, I intend to change the FAX situation so that I don't have to drive back to Briggs Hall to receive a FAX. I'll announce the change, as soon as it happens.

I already miss the ability to walk down the hall and visit with my peers. But, worse yet, I miss my direct connection to the Web that I used to have. I'm back on the modem with most of the "real" people, so things are quite a bit slower, now, as I wait for my email to dribble in or for a Web page to slowly work its way down the screen. However, I am in my new office, and if you come to campus to find me, come directly

to the Laidlaw Bee Research Facility. The parking is free!

W.A.S. Conference Highlights

We had an excellent turnout and fabulous weather for our intensive 2.5-day meeting brilliantly planned and conducted by Dr. Mike Burgett in Corvallis, Oregon. The following are just a few highlights or interesting tidbits from the program.

Dr. Nicola Bradbear, an organizer of the British "Bees in Development," apparently does not mind looking down the barrels of guns as she takes her message of improving the lot of impoverished people by teaching them how to keep bees better and how to utilize hive products better.

Nicola said that pine martins behave like skunks do, here. They walk up to the hives, catch defensive bees in their tails, and then eat them at their leisure at some distance from the hive. She also said that in many places, transportation of honey to markets is the most pressing problem, because each person can only move what he or she can carry, personally. Some of the people carried the honey in goatskins, lacking better containers, and the honey had a pretty peculiar off-taste by the time it reached its destination.

Regardless of what we may think, Langstroth type hives are not very successful in the areas that Nicola tends to visit (Nepal, interior Africa). To evade termites and ants, hives are normally hung in trees. That isn't easy

with a hollow log, but it gets even harder with a movable frame hive that is supposed to be "inspected" at given intervals. Many Langstroth hives, brought to the people as examples of the "right way to do it", end up as furniture in the homes. Nicola simply makes suggestions to improve on the current practices, while not trying to change the world of beekeeping.

After telling us not to ask him, again, when is he going to retire, Jim Tew shared some insights on challenges to beekeeping. As always, Jim was very entertaining while giving us things to consider seriously.

How do we maintain interest without becoming overextended or over committed, and burn out?

We are in a time of "information overload." What is true, or false? Where can we find timely information in a well organized format? [Right here, of course, Jim!]

What is becoming of the industry's "technical support?" Tom Sanford and John Ambrose have left us, and there are a bunch of researchers (Ed. - who used to be young when I was young) who are less than ten [**No, not Jim**], or perhaps just a year or two from retirement. Are we going to be replaced by apiculturists, or are we going extinct? At least the USDA/ARS lab at Tucson is back on the list for "indefinite" funding.

Will "super science" and devout environmentalists influence decisions that lead to the demise of apiculture and beekeeping?

Jim's answer - Get more people interested in bees and beekeeping. If more people know about who we are and what we do, the more apt they are to support us.

Kim Flottum, editor of Bee Culture, arrived on the heels of the EAS Conference held on the edge of Cape Cod in Massachusetts. EAS averages about 550 at their meetings. This year's attendance was about 200 over that, but some of them did not appreciate the heat and humidity that arrived that week.

Kim looked at agriculture and beekeeping from a nearly global perspective over the last 10 years:

1. disposable income rose 65% nationwide
2. farm income decreased 10%
3. consumer prices increased 20%
4. prices for bee commodities dropped 4%, and
5. costs of beekeeping went up 15%.

Could this be why there are 15% fewer beekeepers than 10 years ago?

1. hobbyists dropped from 120,000 to 100,000
2. sideliners (250-350 colonies) went from 3,000 to between 1,000 and 1,500, and
3. commercial operators from 1,500 to less than 800.

Currently, five international companies market 40% of our food. That makes them as large as GM, Ford, Daimler-Chrysler and Wal-Mart. In order to meet the volume and quality demands of such gi-

ants, there will have to be a lot more consolidation in the honey packing business. That means fewer moderate sized packers. There will still be local, niche markets for the neighbor beekeeper, as long as the outlet decides not to deal with the major distributors. If you are in that kind of a situation, do everything you can to keep it! Also, more quality control is on the way for foods, with agency stickers coming for containers.

Kim is pretty sure that tiny monitors for queens are just over the horizon. Hive data will be collected individually and sent back to headquarters for analysis and decision making, away from the hives. Some of those decisions will be about disease and pest control using integrated pest management (IPM) considerations.

Finally, what about genetically manipulated (GM) plants? Do the changes affect bees, in the field or at the hive? Do they have any influence on the quality of the honey? That remains to be seen.

Oregon beekeeper George Hanson already is trying to record apiary information on a hive by hive basis. Each hive has a bar code, identifying it. When the colonies are examined, the information is fed into a handheld data logger. This leads to a print out of the queen source and date of introduction, and the fall frame count, which is tacked to the hive. Tags from "failed" hives go into a bucket, for future analysis. Right now George is still in the collection phase. But, as with

any recording system, you have to use it to be valuable to you. All the data is being downloaded onto a hard drive in his office computer. The data set is huge!

Despite the data collection, George does have time to run a commercial beekeeping operation. I believe that he visits our almond orchards in the early spring, then cherries, pears, blueberries, carrots, mustard, raspberries, radish, meadowfoam, blackberries, vetch, onions, cucumbers, squash, flower seeds, and red clover. Those crops are not synchronized with honey flows, so colonies must be kept strong for long periods of time.

George does not believe in hauling empty hives around, so he uses nucs all season to "boost duds".

Lynn Royce, hired as an insect and mite identification specialist at Oregon State University, still managed to find a little time to test the performance of some Russian queens this past season. She requested nearby commercial beekeepers to run, side by side, pure bred Russian stocks (tiny, dark bees), some Russian queens crossed with Oregon drones, and some fully Oregon stock.

The pure bred Russian stock reduced the level of Varroa mite infestation by 28-30% over the other two stocks.

Then Lynn discussed the results of the monitoring tests they conducted with the sugar shake method. She estimates that 10-15 mites per 300 adult bees (just the

number that fit in a urine specimen cup) or 100 mites on a sticky board (over 3 days [?]) signal the need for a treatment, YESTERDAY.

Her studies also suggested that a "normal" mite load of *Varroa* has a more detrimental effect on drones than use of the legal, recommended treatments.

Most interestingly, Lynn found "triungulins" (first instar, parasitic larvae of blister beetles) in their samples and all over their sticky traps. Usually, those parasites only pick on solitary pollinators.

Margriet Dogterom, recent PhD in apiculture, conducted an in-depth study of blueberry pollination in British Columbia. She started with flower anatomy and reproductive biology. She "emasculated" (removed all the parts except the female organs) flowers, then studied how many pollen grains were needed to get the thirty seeds inside fertilized. Comparing 10, 25, 125, and 300 grains, 125 were adequate, but not quite as good as 300. The others were way too low. Then she covered the blueberry flowers in the field and let one honey bee, bumble bee, blue orchard bee or alfalfa leafcutting bee visit the flower. The flower was immediately removed from the plant for inspection to see how many grains had been delivered.

The leafcutters shivered and stayed home most of the time. They didn't move much pollen, anyway. The honey bees and mason bees averaged about the same number of grains (37-40). But, the

bumble bees were the easy winners, depositing about 70 grains per visit (they "buzz" pollinate).

Closer inspection of returning foragers showed that the nectar collectors were accomplishing more pollination than were pollen collectors. That is because 60% of returning nectar collectors had some blueberry pollen on them, while only 6% of pollen collectors had been in contact with a blueberry flower.

Blueberry growers rent distinctly different types of honey bee colonies and different numbers of colonies for pollination. Data collected from the smaller, recent splits suggested that they weren't accomplishing much at all, compared to their non-split, strong neighbors. Also, it appeared to take about three strong colonies per acre to reach the magic 125 grains per flower average. Many growers were using one or two splits per acre and complaining about "small" berries (average 85% were "under-pollinated"). Berry size and weight are dependent upon the number of seeds developing within them.

Ian Farber and Nicola shared with us their experiences with bees and beekeeping in Slovakia and Afghanistan. Space does not permit me to go into detail (in this issue), but beekeeping in regions with much less capital to invest and limited infrastructure is much more challenging than it is here.

Steve Sheppard shared with us some insights into breeds of honey bees in the U.S. Steve thinks

that of the 25 subspecies (called "races" of honey bees in most text books) of *Apis mellifera* that exist in Europe, we imported only eight. We got the ninth subspecies, from Africa, by default.

Even with those nine subspecies, we only got a few of each of them, suggesting that we left quite a few genes behind with our small samples. Steve refers to that as a genetic "bottleneck."

Steve presented some data that was new to me:

1. there are 43 queen breeders in the country
2. those breeders have 603 breeder queens
3. 890,00 queens were marketed in the U.S. (about 1,400 per breeder)

Steve analyzed 295 queens from western breeders (sellers of 406,800) and 308 from southeast breeders (sellers of the other 483,900). His conclusions were that western and eastern bees are very similar to their neighbors, but quite a bit different from the other side of the country. He suggested that there should be more mixing of genes between the two regions to prevent in-breeding problems. Feral bees used to help, but now they are mostly gone. So, new feral colonies will just be "more of the same."

Thus, Steve sees the introduction of old world genes, like the Yugo and Russian bees, to be a good thing and hopes that more introductions will follow.

Jake Matthenius, retired from the New Jersey Department of Agri-

culture, told us about some of his earliest encounters with honey bees. Stings were treated with laundry bluing (a pigment or dye that colors blue). He endured a sting session that closed both eyes and caused immense swelling on his face and throat. He was around to see skeps "robbed" of their honey, with the consequent loss of the colony. But, it didn't matter, feral colonies and swarms were numerous and pollination simply "happened" in the crop fields.

Previously involved in pollinating blueberries, cranberries, apples, and cucumbers, Jake now keeps a few 8-framers around (because he can lift them). He thinks that 30-40 year old combs should have been replaced decades ago. And, he sees some problems with beekeeping. New people tend to start and quit in one year. Over 50% of New Jersey hobby beekeepers have quit. He said that if we wish to continue having WAS Conferences, we have to champion the cause, at all levels, NOW!

If you would like to attend the next WAS Conference, hold the dates of August 12-15th, 2002. We will be meeting at the Tahoe Biltmore Lodge and Casino, in N. Lake Tahoe.

The facility will be mostly ours, if we fill enough rooms. For those of you who indulge in such things, occasionally, there are all sorts of games intended (over time) to relieve the players of their money. Once in a while a player gets lucky, but don't count on it. The slots at the Biltmore are pretty "loose" in gambling

jargon. And, if you are like me, there are some penny and nickel slots to keep you busy, but not really out much money (you don't win anything to brag about, either).

I will be including a pretty thorough introduction to next years meeting in the next newsletter. But, if you like our slower paced, more social, politics- and business-free atmosphere, we sure would love to have you aboard. The hotel already is taking room reservations.

Hotel rooms, above the casino, cost a bit more than those behind the hotel in the motor lodges, but the prices are the best casino prices on the north shore (ranging from \$70 to \$160, including all taxes, etc.).

Please contact the Biltmore and make your reservations early. There never is an available room in the summer, without a reservation. Change your mind, later? You can release the room up to three days before the meeting without losing a penny!

Call 1-800-254-8667.

New NHB Education Program

The National Honey Board has just released a new educational program about bees and honey, directed toward kids in the classroom. Here is their description:

"Most kids eat honey and see bees around them without knowing about the complex and cooperative

effort that bees go through to make honey. With that in mind, the National Honey Board has created an educational program about honey production that includes an in-depth teacher's guide and creative video for fourth through sixth graders. The program is called "The Honey Files: A Bee's Life" and makes learning about bees and honey fun and easy. The teacher's guide contains 96 pages full of worksheets, class activities, games, fun facts and more. The 20-minute video has a comical host who lightheartedly goes through the exploration of bees, pollination and, of course, honey.

Typically, children begin to learn about science, nature and insects during the fourth through sixth grades. Innovative programs like "The Honey Files: A Bee's Life" can assist educators in making these subjects interesting and fun. The social behavior of honey bees is a fascinating lesson for kids and is an excellent example of how cooperation in a society achieves sweet success.

The National Honey Board went to great lengths to make this program easy to use for teachers. "The Honey Files: A Bee's Life" includes extraordinary detail about the story of bees and the production of honey and an abundance of fun ideas to use in the classroom. Some of the topics covered include honey bee biology, the bee society, and pollination. Classroom activities include learning how bees communicate, reviewing the parts of the flower, looking at the many uses of honey, and much more.

There are several ways to order "The Honey Files: A Bee's Life" education program.

1. Call Annette Laber at the National Honey Board office (800-553-7162).
2. Look for an order form in the National Honey Board's August newsletter.
3. Go to the Honey.com Web site and download an order form - www.honey.com/kids/video.

The educational program, including guide and video, is \$15 (shipping and handling included) and takes about four weeks for delivery. With "The Honey Files: A Bee's Life," kids across America and beyond will learn about bees, honey, and all the many sweet uses for honey."

Sincerely,

Eric Mussen
Entomology Extension
University of California
Davis, CA 95616
Phone: (530) 752-0472
FAX: (530) 752-1537
Email: ecmussen@ucdavis.edu
[URL: entomology.ucdavis.edu/faculty/mussen.html](http://entomology.ucdavis.edu/faculty/mussen.html)

Entomology Department
University of California
Davis, CA 95616