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We asked you to show us your bee license plate and lots of you did. Keep sending them in and we'll keep sharing.

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The past, the present and the future of the A.I. Root Company.

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POSTMASTER: Send address changes to
BEE CULTURE, The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Subscription Information

U.S., one year, \$25; two years, \$48. Newsstand price: \$4.99. All other countries, (U.S. Currency only), \$20.00 per year additional for postage. Digital Edition \$15. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), December 2019, Volume 147, Issue 12, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Subscriptions, Book Orders – www.BeeCulture.com • subscriptions@BeeCulture.com

Advertising – 800.289.7668, Ext. 3216; JNewcombe@BeeCulture.com

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By John Martin





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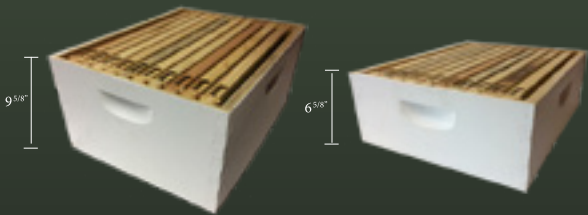
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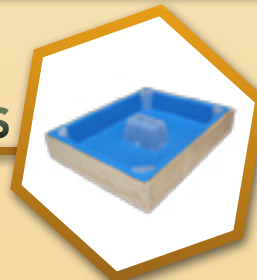


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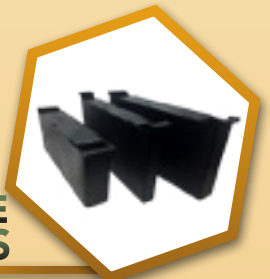
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Climate Change Cachets

I'm a backyard urban beekeeper with 14 nice hives of bees just on the outskirts of a little town in central Kansas. I'm now 86 years young, so most people who read this will simply say he's just old and don't understand the facts, so pay no attention to him. Maybe so.

I write this in response to your article "Climate Change Cachets" which, in my opinion, expresses only one side of the story. Neither am I highly educated, intelligent or an expert on climate change, but I would like to think I listen to and consider all the, so called, facts and opinions presented by both sides of the climate change argument before making a decision, and hope that everyone else would do the same rather than basing their opinion on political agenda and what is published in the media. My opinion of the media is that of Mark Twain who allegedly said "If you don't read the newspaper you are uninformed. If you do read the newspaper you are misinformed." I believe the media publishes only what agrees with their agenda and political propaganda.

Just a couple of facts I would like to include here is that, born in Kansas during the scorching "dirty 30s" I remember many days when Summer temps far exceeded 100° and not in the more than 80 years since that time can I recall such long periods of hot weather. This lengthy period of heat and drought continued from the late 1920s until nearly 1940. Secondly, if what I have learned from written history is factual, then the earth has experienced many, many climate changes over the eons. Just look at the geological history. I think, today, we may be getting some half truths from fear mongers. Now, I am not proclaiming that change is not occurring or that man has not had any effect on the climate (God only knows we have screwed it up in about every other way) and that we should not make every attempt to protect and improve our environment. Of much greater concern, in my opinion, is water conservation which should be among the top priorities considered

for our survival – but that's another issue.

The bees. Don't forget about the bees and climate change. You may recall, several years ago, I sent you an article and a picture that you published in *Bee Culture*, of a fossilized honey bee that is said to have lived 35 million years in what is now Colorado. A beautiful specimen. The earth has witnessed numerous climate changes during that period and the resilient honey bee has survived them all. If anything ever extinguishes the honey bee it won't be climate change, it will be pesticides by man.

Thanks for a great job at *Bee Culture* and thanks for allowing me to vent.

Enjoy your retirement.

Hugh Long
Newton, KS

Up And Over

Just read your Inner Cover blurb about the beeline thing and which way bees travel around obstacles. Very fascinating.

After much thought, I realized that up and over is far more efficient for the bee. If you think about it, left or right produces unknown or unfathomable obstacles that could lead to a dead end. Up and over is always a better faster choice because there are no dead ends with altitude. I'm sure the bees already know this and is information not needed to pass on through a dance.

I really enjoy the magazine.

Harry Martin
Casper, WY

Good Use For Landfills

In response to the reader from Georgia who was upset over a proposed landfill – if done with the environment in mind, it doesn't have to be a bad thing. George Mason University's Honey Bee Initiative (Fairfax Virginia) partnered with the county to convert mowed land at the landfill into meadows that are ideal for honey bee pollination. In October 2016, landfill staff seeded the first two acres with a county-prepared meadow mix, followed by two more seeded acres the following April. During the next five years, the

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landfill complex plans to convert about 25 more acres.

Alexis Slebodnick
Clifton, VA

Changes In 70 Years

As I started reading the June 2019 issue of *Bee Culture* I got to page 9 and spent a long time reflecting on the comments in the article *Major Ag Changes in NZ*. I will copy some of the statements later, but first some of my own.

In the mid-1940s in northern Indiana it was easy to be a beekeeper. Most of the rural residents were farmers who had cows and raised crops. Alfalfa fields were abundant, clover was everywhere, the phrase "Round-up Ready" had not been invented, soybeans were not GMO plants and bees visited the blooms, and when we ran through the rows of corn in the fields we generally received stings from the nettles as the farmers did not use chemicals to kill weeds. Thus, nectar producing





plants and trees were in abundance Most of the year.

It was a great time for beekeeping. Even the state song *Back Home Again In Indiana* had a phrase that reflected beekeeping:

“The new-mown hay sends all its fragrance

Through the fields I used to roam . . .”

It used to be such a joy to drive a country road in the evening and smell the new-mown hay – Just try to find that fragrance here in Maryland! Although I was over six feet tall while in high school, I had to use a step-ladder to super my colonies. Thus this picture from the July 1949 issue of *Gleanings In Bee Culture* is **not** one of an unusual situation for a beekeeper in the mid-1900s – personally, I used a step-ladder to manage the top supers in 1946-50:

- What used to be fields of trees and plants are now real estate developments, parking lots, highways, malls, and fields of round-up-ready crops
- What used to be 10 to 15 acre tracts, fenced with nectar-producing plants on both sides of the fence, are now 50 to 200 acre tracts and neither fences nor nectar-producing plants
- Farmers are using chemicals, sprayed by plane or truck, that are killing colonies
- Glyphosate; Clothianidin; Thiamethoxam
- And last example, but not the least, a Winter loss of near zero percent compared to the present loss of around 40 percent

In summary, while beekeeping in the 1940s was easy and enjoyable, today, for many beekeepers, it is hard and requires constant work fighting pests and disease and trying to manage

colonies to minimize the winter loss. And at the same time the harvest of surplus honey has decreased significantly.

David Smith
Maryland

1880s Bee House

Thought this 1880s beehouse might be of interest.

This unique, very large beehouse is about 16’ x 16’ and housed about 27 hives in the late 1880s. It was built by the Zimmerman family then.

When I purchased this property in 2003, the beehouse and the barn and house were all in very bad shape. We did not even know what the beehouse was for. Since that time, all have been renovated/restored.

The buildings and property are located on a Mississippi River bluffside about 100’ above the Village of Nelson (WI). 25 acres of the property have been donated by me to the Village of Nelson as Thrive! Park with hiking roads/trails that go to the bluff tops.

www.ThrivePark.org

As noted with the historical photos . . .

Beehouse (probably 27 hives; with cupola), barn and house built around 1885. Photo from around 1900 looking down from Pikes Peak.

Next, Beehouse 2003 – Beehouse purchased by Chris. Cupola, roof and floor had been destroyed. Unclear then what building was for.

Then, Beehouse 2003-2017 – Beehouse renovated/restored with new roof, floor, door and repainted. When roof and floor replaced, not aware it was a beehouse or that it had a cupola.

Finally, Beehouse 2019 – Beehouse fully renovated/restored with added cupola (built by Chris) and metal roof.

In discussions with several beekeepers and with experts at the Minnesota State Fair, none had seen a beehouse like this in the lower United States. In Europe, there appear to be more larger bee sheds but few if any this large dedicated to honey bees.

Currently, the beehouse is being used as part of the Thrive!

Center and GChris Sculpture Studio/Gallery and is open to visitors. Could potentially again be used for housing honey bees.

Gary Christopherson
Nelson, WI



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Cal Orey, M.A., is an accomplished author and journalist. She has a master's degree in English from San Francisco State University, and for three decades has written hundreds of articles for national and international magazines. Her books include *The Healing Powers of Vinegar*, *The Healing Powers of Olive Oil*, *The Healing Powers of Coffee*, *The Healing Powers of Chocolate*, *The Healing Powers of Tea*, *202 Pets' Peeves*, and *Doctors' Orders*. She lives in northern California. Readers are invited to visit her website at www.calorey.com, read her blog *The Writing Gourmet* at calorey.blogspot.com, find her on Facebook, and follow her on Twitter.

The Idle Beekeeper; The Low-Effort, Natural Way to Raise Bees, by Bill Anderson. Abrams Press, \$28(US); ISBN: 978-1-4683-1706-0, Hardcover, 288 pages.

How many more people would keep bees if it took just two days of active participation a year? Scientific studies have repeatedly warned of declining bee populations and the repercussions for humans and the environment. If more people realized how easy keeping bees can be, even in the middle of a city, more could do their part to avoid this potential crises.

In his book, *The Idle Beekeeper*, Bill Anderson shares with readers, how to keep a beehive with only two days of work each year – a few hours in the Spring and few more hours in the Fall. At once a how-to guide and a well-written, enjoyable read, the intentional side-effect is participa-



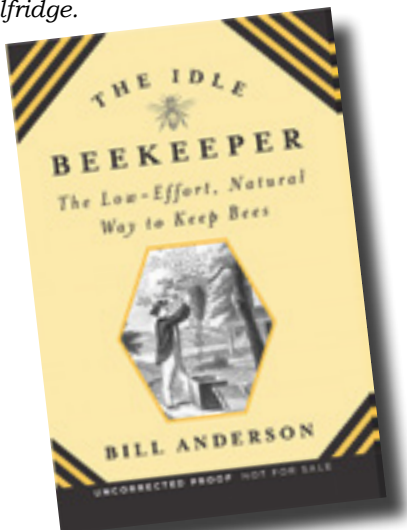
tion in an activity that has benefits reaching far beyond honey and beeswax, enhancing the well-being of the beekeeper and the environment.

This books shows you how to build a hive system developed to allow maximum idleness; harvest honey; extract honeycomb; make mead and beeswax candles; get involved in conservaton efforts and truly enjoy closely observing and understanding these most fascinating and productive of insects and more.

Anderson wants to make it clear – *Idle isn't lazy*. In his first chapter he writes, "Truly lazy people rarely cultivate themselves or the world around them. Idlers try to do both by cannily spending as little time as possible in drudgery so they can invest the maximum doing things that interest them, that make them grow."

There are already an estimated 125,000 beekeepers in the U.S., the vast majority of which are hobbyists, and interest in hobbyist beekeeping is exponentially growing. Bill Anderson calls upon his decades of experience as an urban beekeeper to highlight the invaluable resources that these under-appreciated insects provide and show how simple and rewarding beekeeping can be.

Bill Anderson is an urban beekeeper and educator based in London who writes the regular beekeeping column for *The Idler Magazine*, and his online Idle Beekeeping course is currently available from The Idler website. The other 363 days he isn't tending to his hives, Anderson is a television drama director, working on a huge variety of shows, including *Dr. Who* and *Mr. Selfridge*.



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INNER COVER

A couple of things for the new guy in charge – Jerry Hayes.

Getting out a beekeeping magazine is no joke. If you print jokes people will say you are irreverent. But if you don't, they'll say you are too serious. If you take things from other magazines you're lazy, and if you don't you are too stuck on yourself. If you don't print every word of every contribution you don't appreciate genius, but if you do, the columns are filled with junk. If you change something in an article you are too critical, but if you don't you'll

be blamed for poor editing. Now, like it or not, someone will say I swiped this from some other source. Well, I did.

Another thought that will keep you up at night . . .
The typographical error is a slippery thing and sly.
You can hunt till you are dizzy, but somehow it will get by.
Till the proofs have all been cleared it is strange how still it keeps.
It shrinks down in a corner and it never stirs or peeps.
That typographical error, too small for human eyes
Till the ink is on the paper, when it grows to mountain size.
The editor stares with horror, then grabs his hair and moans.
The proof reader drops her head upon her hands and groans.
The remainder of the issue may be clean as clean can be
But that typographical error is the only thing you'll see.

Readers over the years have sent me both of these when they thought appropriate. Critics abound when it comes to the written word on paper, especially now when there are so many words that come and vanish in an instant on your phone or computer. I often think they are not really real. Paper is, more or less, permanent, and it is easy for readers to hold and wave and cheer with, or swing wildly and yell at the contents, or cherish and bring close. You just can't do that with a cell phone or tablet, just hit delete and it's gone. Paper is real though, it has color and texture and weight and importance. And if you want whatever it is you want to last, it must be in writing. And what you are doing is writing for eternity.

We know our past, our history, our faults, ambitions, accomplishments, inventions, goals, wishes, desires and all the rest because, on the shelves behind you in your new office sits nearly every written word, in ink on paper, about what we do, have done, and will do in our world of bees and beekeeping, beekeepers and politics, discoveries and tragedies and all the rest. In ink, on paper. Forever.

That forever word is kind of scary. It is supposed to be. Don't forget forever when you make a claim, state a fact, ignore a writer, claim victory or admit defeat. Don't forget forever when you praise and especially when you criticize. Simply, don't ever forget forever, for the future will never forget. The future will come and visit. And the future doesn't really care what you were thinking then. It only cares what you wrote, then. So always write with care, and make sure those who write with your blessings write with the future in mind. With the industry in mind. With our bees in mind.

At the same time, write so those who read are better for reading what you have written. Do not waste their time or energy, don't insult their intelligence, and do not flaunt what you may think is yours. Talk to the people who respect what you do with the same respect they give to you. Many, probably very many are as smart as you are, and just know that even more are smarter. They already know, and they are just making sure that you

do to.

Look to the future every day. See past the horizon because that's what those people want who are reading what you write. They want to be prepared. They don't like surprises. They need to be careful and miss the ruts in the road. They need to see what you can see from where you sit.

And oh, what you can see. You have the 10,000 foot view that sees the beeyard, the honey house, the beehive, the newest, the best, the worst and everything between. You have your fingers on all of these, all of the time. Grab as much of all of this as you can all of the time and give it all away. Share what you see, what you hear, where you go and who you know. You are the source, the beginning, the news, the introduction of what will be. You are the voice.

Which is why the whole world wants a piece of you, your time, your favor, and your paper and ink. You are the whole Universe to those who want to reach those who read your paper and ink. Be very careful about this. Do not let the forces of capitalism twist what you provide into a message for money and greed. Do not let those who have power enlist your special forces for their causes alone. Carefully filter what you see and hear and learn with your experience, your wisdom and seeking the good advice of those you trust. Always, use that trust you have in others to your best advantage. You will not go wrong when you do.

Finally, do not take those here you share your world with for granted. Each is special. Each is necessary. Each has an investment in you, your world and your ink and paper.

The Last One Of These.

Ink and paper. It was here long before you and I, and it will be here long after we are gone. Use what is already done, make good what you do today, and leave the best of you for the future.

And one more thing. Enjoy this opportunity. It is the best place to be in the world. Anywhere, ever.

•

The ironies of this job have always been high on my list of things to pay attention to from almost the first day I was here. Let me tell you one of them.

Very, very early on I was at an EAS Conference when Randolph Furbert, a well known beekeeper from Bermuda (well, well known to everybody but me at the time) came up to me and poked me repeatedly in the chest with what can only be described as the beekeeper finger, and loudly asked if I was that “new Editor fellow at Root.” I looked him in the eye and said, “Yes Sir, I Am”, loud and proud and ready to dance. Randolph always stood out in a crowd, and he was never, ever quiet.

He looked me straight in the eye and he said, “Son, you won’t believe the places you’ll go, the people you’ll meet, and the things you’ll do because of bees. Why I know a thousand people, been all the way around the world, and danced with a princess because of bees. So will you if you pay attention.” And off he went, disappearing into the lunch time crowd, shouting and waving and patting on the back the many people he knew and shaking hands with anybody who would reach out.

I’ve seen him maybe 50 times since then, or maybe it only seems like 50, and every time he’s laughing, smiling, shaking hands, and every once in awhile he looks me straight in the eye and said, “Didn’t I tell ya?” And then he’d tell me about another meeting he had just attended, and what country he was planning to visit next.

Randolph passed the last week I was on this job. Did I mention Ironies? But he was as right as rain about the rest. The people I’ve met, the places I’ve been and the things I’ve been able to do because of bees was right on. If you’re churchied, our minister friend Doug would say I’ve been blessed. But if you’re more or

less unchurchied, like I am, you’d have to settle for – I’m the luckiest guy in the world. Kath, my much better half is still here on the job, but she’s one of the real reasons I’ve had all this good fortune. What we do, we do together, so we have experienced all of these things together, because what we do we do together.

We’ve been able to meet thousands and thousands of people from all over the world because of this job. We’ve traveled to six countries to give talks about bees and beekeeping and beekeepers, but even better, have been invited to stay in the homes of many of the people who invited us.

Because of what we do we have friends we’ve never met face to face on the other side of the globe, and because of what I do I’ve had what I’ve written transcribed into languages I cannot speak, and have appeared as a spokesperson for bees on television in more countries than I can count. But Kath typed it before it got transcribed, and made sure the schedule worked for the TV people. I’ve been lucky, with a lot of help.

Like Randolph, I’ve danced with a (honey) queen, and we’ve dined with movie and television stars who know bees, and we’ve been invited to the White House several times. It has been a very grand ride.

•

And more Irony. Another long time very good friend passed this last week (if you’re a long time very good friend you might not want to admit it right now). For reasons only known to the people who were here before me there were not a lot of stories sitting in files waiting to be published when I arrived. Hardly any, exactly. But there was one file, with four or five short, typed articles in it. Only a couple of pages long, each double spaced, authors name, address and phone number on the top left hand corner of every page on what we used to call erasable typing paper, so the author could easily make last minute changes and the editor could easily make any edits before sending it to typesetting.

The author of all of these was Alan Harman. Not related to Ann by the way. Originally from New Zealand, he was a correspondent for

WardsAuto News, which still covers the global auto industry. In his day he lived in New Zealand, Australia, Ireland, South Africa and finally Michigan. He was a major correspondent for the industry when the last auto manufacturing plant in Australia closed.

How he found *Bee Culture* I was never sure of, but we are one of a host of other small agriculture magazines he made contributions to as a free-lance writer. He was one of our regulars when we did the *Gleanings* section for several years, and a regular regular for the BUZZ after that started.

I still have one of his typewritten articles in that original file folder. I probably talked to him at least once a month and often more when he was looking for sources or to clarify a point. We became quite good friends over the years, and he and his wife Barbara came to our wedding. They lived near Detroit, and she was for a time his Editor at the Wards publication.

You have read what he has written hundreds of times, often not recognized as he said use it if you want or not but pay me if you do, but always recognized by our *Bee Culture* staff. And of late, he was the author of our BUZZ series on Climate Cache because he had a thing about the natural world – he was an avid, and global fisherman – and he didn’t want to see his lifetime hobby change. He did good things with his life and in his life. I’ll miss him. And so will you.

•

So, winding down, what’s next? For awhile I’m going to hang out here, until the new guy gets up to speed on some of the non-beekeeping things he’ll have to learn about. Budgets, printing, schedules, authors, special issues and events – things he already knows a bit about, but the details still haven’t jelled. I’ll probably do that until a bit after New Years, and then wind down pretty much all the way.

Writing? I don’t know if the new Editor would want that – so we’ll see. He has, as you probably know a fair history doing exactly that so he’ll have that covered pretty much. We’ll see. For other outlets however, absolutely for any that ask, and I’ll

be asking for any I see interesting. It will be good to not have to write on such tight deadlines I think. The books I've done over the years were more or less on some kind of deadline, but not a crazy one like having 16 magazines a year to get out. On my schedule instead of somebody else's schedule sounds kind of interesting, so we'll see on that. There are, actually, three related topics I'd like to cover that all kind of relate to what I've been up to for the last 33 years, so maybe that can work out.

You know, there's one book that I'd like to do, and that a publisher I know is actually kind of interested in. If you have spent time in airports much, you know how crazy people can be. They are focused on time and place and pretty much everything else gets tenth place.

Imagine for a moment working in an airport as a driver of one of those carts that carry people from gate to gate because their luggage is heavy, they're old (yes, I use them), because they don't know where they are and on and on.

Actually, when I'm headed to a distant gate I'll flag them down, sit in front with them and chat. You cannot, would not believe the stories they tell me about what people will do in an airport. I'm guessing they don't get to tell those stories very often, and I'm a great outlet, and we'll chat all they way to the gate, and sometimes just sit there and talk some more.

And here's something you wouldn't think, but these stories tend to be regional. Drivers in the south tell similar stories, drivers in the west and on the east coast tell stories very different from each other, and international airports, the big ones, are really different. Stay tuned, I may get to do that yet.

But the thing that interests me most coming up is that I do get to keep doing some of the things I've been doing. The powers that be want the KIM&JIM show to go on, and so does Jim, so that will keep us both on our toes. We hope for about one a month or so, more sometimes, but not less we hope. The technology keeps getting better so we hope to be outside more, and talk to a wider variety of people. And we've got some

good people lined up so it should be interesting. You can see the last dozen or so we've done on our web page, and all the new ones will be there, so when you can, take a peek and see what's going on.

Bee Culture wants to continue sponsoring the BeekeepingToday-Podcast, so those, too will continue. Jeff Ott is mostly in charge of this because he runs all the technology, while both of us work on the program itself. But we are branching out from just bees. We've kind of an umbrella operation called Growing-PlanetMedia that will talk not only to beekeepers and others in our industry, but are looking at almost any ag industry group that would like a bit of exposure. There will be more programs, but each will be shorter. We've found that an hour, though it covers a lot, is a lot to listen to. Most folks do a 30 - 35 minute or so drive to work so we're looking at a half hour or so program for all of these. Time will tell, but if your're interested tune in and listen to what we're up to.

A whole bunch of years ago I sat staring at a blank piece of paper wondering what the heck I'd gotten myself into this time. I'd spent some time looking at what those who sat in this chair before me had done with the opportunity they had. Some dispensed beekeeping advice because they were long-time expert beekeepers. Others talked about meetings they went to, experiments they had carried out, running the factory they were a part of or accomplishments they had achieved. Some looked past the immediate presence of the paper they were writing on and predicted events yet to come, while others looked at what had happened and what it meant to those fortunate enough to read those words.

My formal education was in plants and entomology, and my work experience had been in plants and honey bee research. I wasn't a commercial beekeeper by any stretch, but I did have some insight into those things in the world that could make beekeeping better, or worse.

And I knew that there were things that the folks who read this magazine needed to know to make it

better, or worse. So, what I needed this to be, I thought, was a buffer between what was outside of our control, and what things we did have control of that could affect the rest of the world. That bit of information struck me as perfect, and that piece of beekeeping equipment was the Inner Cover - it kept what was out, out, and what was in, in. The perfect buffer. I think it's worked.

So, with that bit of nostalgia I'll put the red pen away one last time, unplug my coffee cup heater, turn off the lights and call it a day. For listening to this for all this time, thank you. May your bees prosper, and you and yours live to enjoy them forever.

And give Jerry a royal Cheer.






PLATE TECTONICS

In the September issue we asked you all to send in your bee related license plates. We got so many we couldn't fit them all in one month. So keep sending them and we'll keep sharing them. Send a cell phone shot to info@beeculture.com, with PLATE in the subject box. We'll share it with the world.



Watch For More In Future Issues!
Thanks To Everyone Who Sent
In Photos. Send More!!!

Check out our FREE Beekeeping Resources:



HONEY BEE HEALTH COALITION



VARROA MANAGEMENT GUIDE

A practical guide and step-by-step demonstration videos featuring safe, effective methods to detect, monitor, and control Varroa mite infestations.

HONEYBEEHEALTHCOALITION.ORG/VARROA

BMPs FOR BEE HEALTH

A guide for beekeepers featuring Best Management Practices on safety, pesticide exposure, bee nutrition, hive maintenance, treatment of pests and disease, and more.

HONEYBEEHEALTHCOALITION.ORG/HIVEHEALTHBMPs

VARROA MANAGEMENT TOOL

An interactive decision tree that provides beekeepers with Varroa management and treatment options based on their specific circumstances and hive conditions.

HONEYBEEHEALTHCOALITION.ORG/VARROATOOL

It's Summers Time –

End Of The Year Thoughts

Once again another year has gone zooming by. As I write this it is early November and tomorrow night here in northeast Ohio we have a forecast of snow and 12°F. – a little extreme so early in the season. The woolly bear caterpillars that have been spotted have been mostly black which says cold, hard Winter ahead. So it looks like we better get those birds hunkered down and warm.

We had a great time at *Bee Culture's* October Event, celebrating The History of Beekeeping and the 150th Anniversary of the A.I. Root Company. There were about 75 of us and it was loads of fun.



Kim Flottum, as Amos Ives Root.

We had A.I. Root (Kim Flottum), L.L. Langstroth (Marc Hoffman) and C.P. Dadant (Jerry Hayes) on board to educate and entertain us. These guys did a great job. In fact, such a good job that there was talk of them going on the road. And Kim has already been asked to do his performance as A.I. at one of the local bee association Christmas dinners. Who knows, Kim may add this to his post retirement activities.

As has become our tradition the weekend started with Friday afternoon tours of the Root Candle factory. If you have had the chance in the past for one of Kim's tours you know what a treat it is. This is a very cool place to have spent a large chunk of our lives.

All of our speakers have written for *Bee Culture* over the years. Jim Tew was writing for the magazine before Kim started. You can read about that in his article in this issue. Jim Thompson is a somewhat regular writer for us and actually worked at the Root Company some years ago. So it felt like family with all of them here.

Tammy Horn Potter was our one female speaker and spoke about Jane Cole, who worked at the Root Company and other women in beekeeping history. We also had



Our amazing speakers – left to right Malcolm Sanford, Tammy Horn-Potter, Kim Flottum, Jerry Hayes, Marc Hoffman, Jim Thompson, Jim Tew and Wyatt Mangum.



Amos Ives Root, C.P. Dadant and the Reverend L.L. Langstroth settling in for a chat about what's going on in the bee world.



Brad Root welcoming everyone to our event.



L.L. Langstroth demonstrating to all how his hive works.



Kim, Jerry and Marc talking over their strategy for the next day's performance. Great job guys! Thanks.

Wyatt Mangum, Jim Thompson, Jim Tew and Malcolm Sanford all talking about different areas in beekeeping history.

Brad Root was with us all weekend and opened up our event welcoming everyone to the Root Company. Sunday ended on a bit of an emotional note as Brad officially announced Kim's retirement as Editor of *Bee Culture*. Brad also officially welcomed our new Editor, Jerry Hayes to *Bee Culture*.

This is a little difficult, no it's really hard to write about Kim retiring. Actually, I'm very excited for him because he has some very interesting projects that will be taking up his time. But we've been doing this together for over 30 years now, so life will be different – not bad, but just very different.

As you know if you've been reading this column from the beginning, Kim and I live just about seven miles down the road, so it's not like he's going very far. And, if you know me at all, you know I've never quite gotten over my fear of driving in snow and on ice. So I'm guessing there will be a lot of mornings when he'll be bringing me to work. At least that's my plan.

You'll still be seeing a lot of Kim, I suspect. He already has several speaking trips lined up for the beginning of next year. And he and Jim Tew will continue the KIM&JIM show webinars. And he's got big plans to expand the Beekeeping Today Podcasts with Jeff Ott. And I think there are a couple of more books spinning around in his head. And he's sticking around part time to help me finish up *ABC & XYZ*.

So here we go – starting the newest part of this life journey that we are on. Over the years a lot of people have asked how we do this dance that we've been doing for so long. They'll say 'Oh I couldn't go to work with my spouse everyday.' But for Kim and I it has worked beautifully. That's not to say that we haven't banged heads

a few times along the way. But for the most part it's been wonderful. I can't imagine any other way, although I never imagined this way before it just sort of crept up on us.

And now let's talk about the new guy – Jerry Hayes. We've known Jerry for a lot of years – Kim certainly more years than I have. So, he's been a familiar face for a while and more recently a good friend. He's been in this industry for as long as we have, so he knows a lot of people and a lot of stuff about beekeeping and beekeepers. And this is a big change for him also. He's moving to Ohio from St. Louis – selling a house, packing, moving, buying a new house, being the boss. Welcome to *Bee Culture*, Jerry. We – Kim, Jean, Amanda and myself will do all that we can to make this change easy for you.

So that's the scoop folks! Please wish us luck and be patient with us as we run head first into this next episode. We'll do our best to keep on task!

This is our Interview issue and we have a bunch of amazing stories about amazing people. We hope you enjoy it. Take your time and learn about some people you haven't heard of before.

Now let's wrap it up with a little bit about the birds. This past week we actually had a couple of nights of frost. And Kim was out of town, so it became my chore to let the birds out in the morning – usually he does that while I pack lunch and make breakfast. The funniest thing was the ducks on their very first morning of the iced over pool. This is their first Winter being not even a year old yet. There's one female that heads right for the pool every morning and jumps right in. Surprise! The pool water was frozen solid, so she landed with a bit of a thump and just stood there looking very confused. I wished I had my phone so I could've gotten a picture.

We're going into Winter with 20 chickens and seven ducks. Hopefully we'll come out of Winter with the same count. The young chickens have started laying and the ducks also, at least I think so. I'm finding all sorts of eggs down on the ground, not in the nesting box. But I'm not sure all of the young chickens have figured out the nesting boxes yet.

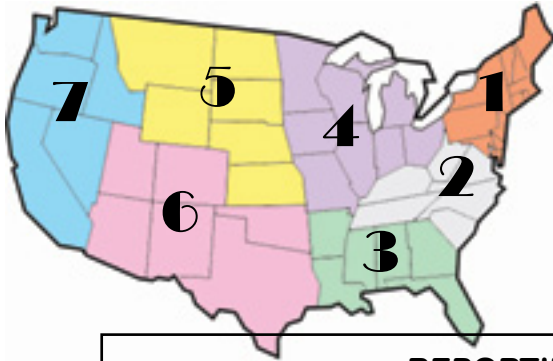
The holiday season is creeping up fast and will be upon us as you get this issue. I wish you all a peaceful, and Happy Thanksgiving. And whatever your family looks like, I hope you are surrounded by them for a Wonderfully, Merry Christmas.

I'll see you in 2020 – can you believe it. It got here fast. Thanks for sticking with us.

Jacky Summers



DECEMBER - REGIONAL HONEY PRICE REPORT



We're throwing a lot of numbers at you this month but we think you'll find them useful. Below is our monthly report from December 2018 and below that this month's report. You can see the difference for each product over the course of year, by region. You can look at yours and see what's happened over the past 12 months. One thing to consider looking at these two reports is that they are actually very similar. Some regions fluctuate more than others but overall they are about the same. What else in your operation is the same, however? Supplies, gas, packages or nucs, labor, fees? Bulk honey is down and retail and wholesale honey is up. Go figure.

REPORTING REGIONS - 2018								SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	2.41	2.15	2.45	2.56	2.25	2.15	3.00	1.74-3.25	2.32	2.32	2.16	2.23
55 Gal. Drum, Ambr	2.17	2.10	2.07	2.42	2.17	2.05	2.75	1.35-3.00	2.16	2.16	2.06	2.17
60# Light (retail)	222.87	181.75	188.75	207.55	177.00	193.94	220.00	150.00-325.00	208.24	3.47	193.41	199.89
60# Amber (retail)	221.71	182.80	187.50	203.55	221.71	188.75	227.50	143.74-325.00	209.05	3.48	191.57	204.85
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	93.01	74.33	90.80	67.00	57.60	84.00	93.01	57.60-144.00	85.21	7.10	86.86	85.48
1# 24/case	127.39	106.87	126.37	118.63	115.44	104.91	136.20	45.00-211.20	126.67	5.28	128.45	126.50
2# 12/case	125.14	95.63	116.05	111.44	97.44	104.40	114.00	78.00-192.00	115.27	4.80	114.31	110.74
12.oz. Plas. 24/cs	114.03	101.20	88.00	89.14	78.00	124.00	103.20	53.99-196.00	103.07	5.73	98.77	96.28
5# 6/case	134.96	110.00	133.66	120.58	107.28	115.50	134.96	71.50-210.00	129.17	4.31	128.19	126.38
Quarts 12/case	174.37	149.00	131.01	163.30	132.00	139.48	144.00	109.20-280.00	154.13	4.28	146.33	141.27
Pints 12/case	102.46	93.44	74.17	107.33	102.46	84.08	84.00	65.00-160.00	92.42	5.13	96.14	87.38
RETAIL SHELF PRICES												
1/2#	5.22	4.26	4.70	4.45	4.41	3.54	7.00	2.08-9.00	4.90	9.80	5.07	4.77
12 oz. Plastic	6.16	5.22	6.11	5.68	4.72	6.13	6.93	2.68-10.00	5.99	7.98	6.12	5.81
1# Glass/Plastic	8.28	7.22	7.41	6.63	6.72	6.56	9.08	4.00-14.00	7.56	7.56	7.59	7.34
2# Glass/Plastic	13.22	10.55	13.18	11.92	12.57	9.48	16.17	6.40-21.00	12.73	6.37	12.88	12.37
Pint	11.17	8.93	8.12	11.64	8.38	10.01	10.47	4.00-21.00	9.85	6.56	10.20	10.19
Quart	20.30	17.19	15.23	14.80	16.28	17.66	20.69	8.00-38.00	17.61	5.87	16.38	17.15
5# Glass/Plastic	29.74	25.00	36.50	28.20	23.03	22.85	29.74	15.00-48.00	27.97	5.59	26.17	27.28
1# Cream	10.09	7.97	8.00	9.40	8.47	8.50	10.50	6.00-16.00	9.17	9.17	9.53	9.23
1# Cut Comb	13.60	8.88	10.49	10.80	15.50	10.50	14.00	6.00-24.00	12.20	12.20	11.99	10.67
Ross Round	9.61	6.77	9.61	9.00	9.61	10.50	12.49	6.50-13.00	9.48	12.64	8.88	9.37
Wholesale Wax (Lt)	7.89	5.15	5.42	6.58	6.00	4.83	9.80	2.60-15.00	6.99	-	6.54	6.01
Wholesale Wax (Dk)	7.34	4.83	4.39	5.72	7.34	3.33	10.00	2.50-15.00	5.93	-	5.48	5.39
Pollination Fee/Col.	90.35	73.75	58.75	85.00	90.35	92.00	89.00	30.00-160.00	85.69	-	90.45	81.30

REPORTING REGIONS - 2019								SUMMARY			History	
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EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	1.98	2.25	2.28	2.23	1.78	2.01	2.40	1.52-2.50	2.09	2.09	2.21	2.32
55 Gal. Drum, Ambr	1.97	2.15	2.13	2.19	2.00	1.86	2.00	1.35-2.55	2.05	2.05	2.11	2.16
60# Light (retail)	236.11	186.67	190.00	167.50	155.00	181.55	218.33	120.00-325.00	200.28	3.34	195.93	208.24
60# Amber (retail)	229.55	190.75	187.50	173.60	130.00	177.15	220.83	120.00-325.00	199.32	3.32	194.88	209.05
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	106.83	74.50	110.31	75.00	78.60	84.00	110.31	57.60-194.40	94.62	7.88	89.54	85.21
1# 24/case	150.91	108.80	130.10	105.30	137.33	133.32	150.00	63.00-300.00	133.86	5.58	135.50	126.67
2# 12/case	134.02	99.40	117.45	98.32	111.84	112.80	264.00	79.20-264.00	126.27	5.26	126.65	115.27
12.oz. Plas. 24/cs	104.01	111.31	100.00	87.80	89.88	108.48	84.00	66.00-172.80	99.74	5.54	100.12	103.07
5# 6/case	147.93	115.95	145.28	122.05	113.16	126.00	145.28	71.50-240.00	134.81	4.49	140.76	129.17
Quarts 12/case	193.74	164.64	133.50	147.40	140.87	155.51	144.00	93.60-300.00	159.80	4.44	155.43	154.13
Pints 12/case	105.69	102.06	78.67	91.17	94.00	88.72	84.00	65.00-140.00	93.68	5.20	88.92	92.42
RETAIL SHELF PRICES												
1/2#	6.03	5.86	4.58	5.50	4.40	5.00	5.81	3.09-9.00	5.58	11.16	5.19	4.90
12 oz. Plastic	6.99	6.59	5.05	5.82	5.65	6.57	6.67	3.50-12.00	6.31	8.41	5.99	5.99
1# Glass/Plastic	9.02	7.86	7.53	6.95	7.82	6.50	9.25	4.50-17.00	7.99	7.99	8.06	7.56
2# Glass/Plastic	15.40	14.47	13.37	11.90	13.60	9.93	14.50	6.78-25.00	13.80	6.90	14.09	12.73
Pint	12.36	10.34	8.25	10.20	11.00	10.31	10.20	6.00-16.00	10.21	6.81	69.99	9.85
Quart	22.31	16.53	15.41	18.00	15.85	17.82	19.46	8.00-32.00	17.94	5.98	17.91	17.61
5# Glass/Plastic	30.36	27.03	40.00	27.75	27.70	27.75	40.00	15.00-50.00	29.76	5.95	28.99	27.97
1# Cream	11.09	8.75	7.00	9.86	7.83	8.50	14.00	6.00-16.00	10.18	10.18	9.90	9.17
1# Cut Comb	14.43	14.99	9.98	13.61	12.50	10.50	14.17	6.00-24.00	13.35	13.35	12.98	12.20
Ross Round	11.43	6.95	11.41	11.00	12.00	10.75	13.75	6.60-17.00	11.03	14.70	10.16	9.48
Wholesale Wax (Lt)	7.97	5.47	4.70	6.64	6.50	4.40	8.60	3.00-15.00	6.73	-	6.96	6.99
Wholesale Wax (Dk)	6.84	5.07	4.02	4.83	7.00	3.08	15.00	2.00-15.00	5.80	-	6.06	5.93
Pollination Fee/Col.	98.75	74.00	80.00	93.75	200.00	92.00	45.00	40.00-200.00	89.88	-	86.67	85.69

NEXT MONTH

Welcome to NEXT MONTH, where our Honey Reporters share a line or two about what they will be doing NEXT month with their bees. Advice is given for each region so you can see what others are doing where you are, and, of course in all the rest of the regions. Check these out. These reporters are successful in business.

Region One

- Clear dead bees from entrance
- Check Food stores
- No brood, Oxalic Acid vaporization or drizzle *Varroa* Treatment option
- Be sure upper entrance for moisture removal is open
- Its January in the north, nothing to do. Watch Netflix
- Change Bear Fence Batteries
- Clear Deep Snow from Entrance
- Check hive Wrap and mouse guards are in place

Region Two

- Feed and Read *Bee Culture*
- Get ready to make splits
- Good ventilation
- Feed Winter Patties
- Is Queen starting to lay?
- Monitor Hive Temperature remotely
- Low Brood. Oxalic Acid drizzle for *Varroa* treatment option
- Add top feeder
- Lift cover on warm day for a hive “peak”.
- Clear colony entrance
- Check weight of hive by tilting up from rear handhold

Region Three

- Minor brood area, potential Oxalic Acid *Varroa* Treatment time.
- Check yard for weather damage.
- Feed, Feed, Feed
- Repair extra equipment
- Treat for mites
- Entrance reducers installed to prevent robbing
- Install pollen sub. Patties
- Wellness check
- Feed sugar syrup to needy hives

Region Four

- Feed Sugar Syrup and pollen sub patties
- Replenish ‘sugar bricks’
- Monitor Food stores
- Hope & Pray
- Remove deadouts and prepare and repair equipment for splits
- Nothing, we let them sit after feeding and varroa treatment.
- Attend Bee Meetings to learn about latest research

Region Five

- Feed then feed some more
- Feed candy boards
- Feed pollen sub.
- Oxalic acid drizzle for *Varroa* control
- Nothing. If I haven’t prepared them in late Summer/early Fall it’s too late now.
- Clean out entrances of dead bees and snow
- Pollen patties
- Mite treatment strips or thymol gel

Region Six

- Keep snow away from entrances
- Add upper insulation
- Feed
- Our coldest month. All appendages are crossed
- Check on outyards that colonies are not snow bound
- Nothing
- Feed sugar syrup
- In Arizona, so always doing mite samples
- Treat for mites in Texas

Region Seven

- Too cold to open hives
- Feed syrup and patties
- Treat for mites after sampling, then sample again to see if it worked.
- Check food stores by hive weight, tilting or electronic weight
- Feed Fondant as needed
- Cleanout deadouts
- Feed and treat

Honey Reporters Wanted

We are expanding our Honey Reporter population and need new reporters in EVERY region. We ask that you fill in most of the wholesale or retail or both sections, most months, and our short survey on the back. We give you a FREE subscription for your service. So if you are interested send an email to Amanda@BeeCulture.com and put REPORTER in the subject line. Include name, email, phone number and mailing address and we’ll get you the next Honey Report form. Sign up today and be a part of the BEST Monthly Honey Price and Beekeeping Management Report in the industry.

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“But one thing is needful; and Mary hath chosen that good part, which shall not be taken away from her.” – Luke 10:42

THE STORY OF A.I. ROOT

The Final Chapter

A.I. Root

I do not like to take exception to anything that is published in *Gleanings in Bee Culture*. Since early childhood I have been a devoted disciple of A.I. Root. I was never privileged to see him in life, but I have walked with him in the garden, in the early morning when the dew was still on the roses and with him I have listened to the birds singing their sweetest songs and I have strolled across the fields with him as he discovered some new object of interest and told about it in *Gleanings*. So I come to write my first word to *Gleanings* to take exception to something said therein.

In the last number of *Gleanings* you say: “In this issue, more than five years after his death, A.I. Root finally says good-bye to his readers.” I think not. A.I. Root still lives. He lives in the hearts of a multitude of people who are not beekeepers as well as those that are. His influence for good vibrates to the ends of the earth – he hath truly chosen that good part which shall not be taken away from him.

He came into my life in some mysterious way so early in my childhood that I can scarcely remember when I was not interested in the things that interested him. I was fascinated by his studies in bee culture and I have ever sought to exemplify the Christian life which he lived. Having been raised in a section of a country which was not adapted to profitable beekeeping, when I came to the age of choosing my life’s activity and was still under the influence of that divinity which inspired the pen of A.I. Root, I took to religious expression and became a minister of the gospel.

However, I have not ceased to walk through the lanes and by-ways of nature where God reveals himself in silent but impressive voice and there commune with those ethereal waves that as I believe, connect heaven and earth in no more mysterious way than we now hear by means of radio. The secret A.I. Root’s life was the secret of heaven. Somewhere along the way he came in contact with God through Christ. He conceived the fact that God and life are one. And if God is life, then he

is interested in all our doings. In such a case God becomes a senior partner and it certainly seemed that, like Enoch of old, he walked with God.

His form now rests in silence and his pen indeed is mute; but in the hearts of his readers he still lives and they, in turn, will impart to their posterity something of his fine influence until here in this world that which he has chosen shall not be taken away from him and in the world toward which the living now incline I think he still enjoys the blissful springtime of growing flowers, singing birds and humming bees and sunlit rays that spray the golden streets with glory until it seems I see him there as one I hoped I might see him in Medina.

Yes, dear editor, you are right when you say he “says good-bye to his readers,” but I think it is only such a good-bye as we say to those who take a voyage and then will meet again, for he lives. He lives in the hearts of his children as they carry forward the work he has so well advanced; he lives in the hearts of his readers, who loved him for his purity of life; he lives eternally where there are no good-byes.

(Rev.) J.R. Steele

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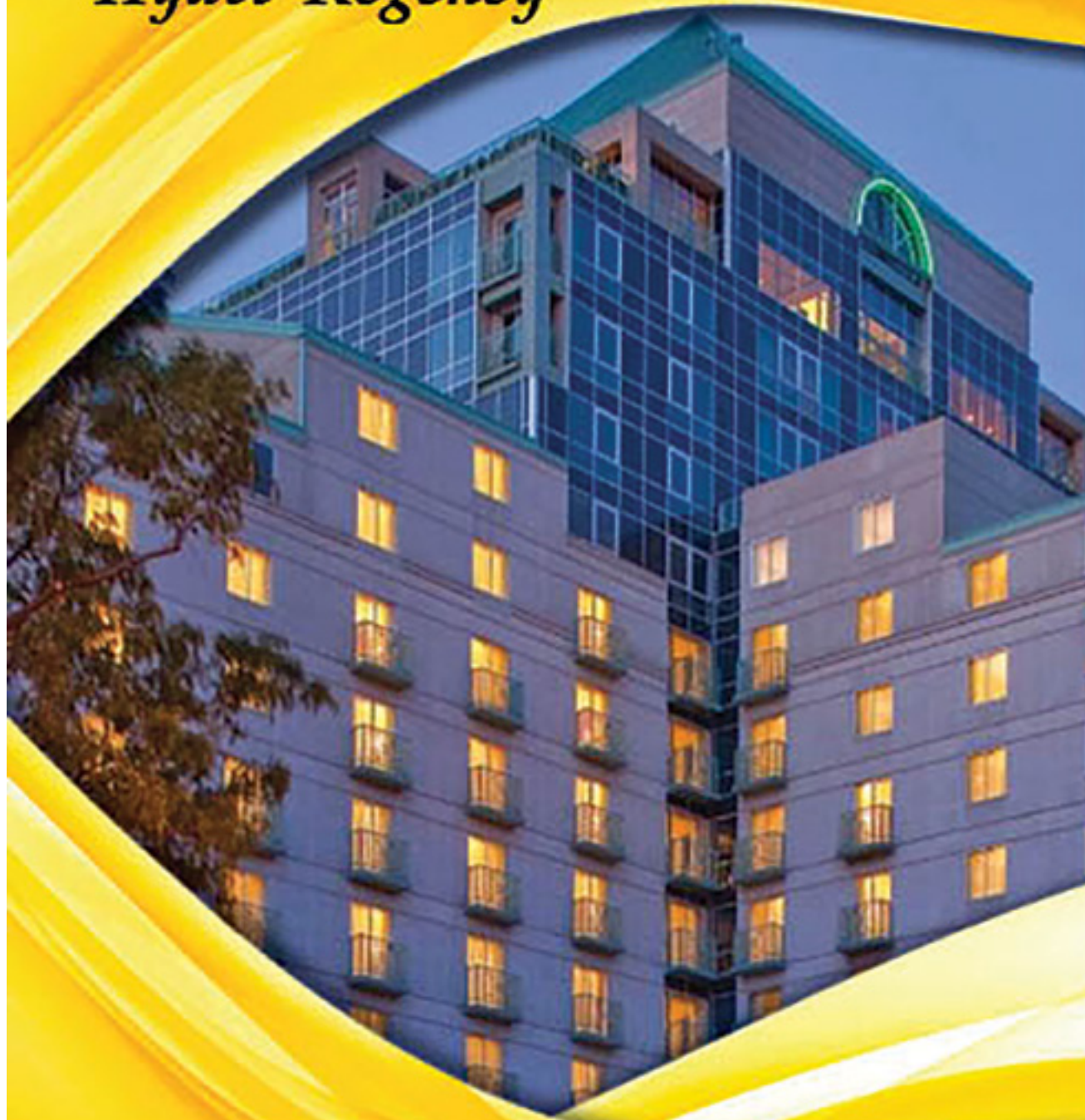
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mice and rain will be ok. *Jennifer Berry, GA*

First thing I do is inspect the dead colony and try to determine why it died. If no contagious disease appears to be present, I will give any full supers of honey from the hive to another hive that is short on Winter honey, leave partially filled supers with capped honey out for the bees to rob clean of honey. Once the supers are cleaned out of honey, I place the supers of empty comb on top of the inner covers of hives so the bees can keep the wax moths and SHB at bay until the hard frosts come and I can put them away in mouse-proof storage for Winter. *Ross Conrad, VT*

Inspect the deadout for disease, such as American foulbrood. If disease is suspected, and confirmed if possible, destroy all equipment. If no disease, remove any old or damaged comb, clean up hive parts and store protected from pests until next bee season. *Ann Harman, VA*

Quick take it apart and see if I can figure out what went wrong, and why. Save the honey if it's safe for other colonies or for splits and packages next Spring. If I can, move the equipment to someplace safe from mice and such until I can get it cleaned up and ready to reuse. However, if I find the problem was AFB, or at least I suspect it was, quick take a sample and send it in, then bag the equipment so bees and others can't get access to it until I know. *Kim Flottum, OH*

Hate to sound arrogant but never have dead outs at this time of year or really ever. I guess if I did I would try to determine why they died, clean bees out, scrape off wax and propolis, repair any defects, eliminate any affected comb and stack them outside in sunlight so last season wax moths don't try. We had a heavy frost this morning so cold weather is a good thing. I'm moving and sold my colonies. I need to buy a few more. Merry Christmas *Gerald Hayes, OH*

Question 2 What's on your wish list for Christmas this year?

I want to get a couple cases of those super cute glass honey bear bottles so I can fill them with dark honey to the head and fill the head with light honey because I love them so much! I'd also like to get a new bee lab for NC State, but I don't think Santa has that kind of money! *Jessica Louque, NC*

Hydraulic lift for hives and honey supers for my truck, so this old man can stay in the game! – *Ed Colby, CO*

Our Christmas list for this year is a solar wax melter, assembled frames with plastic foundation, and some new veils. Oh and our forever Christmas wish list is for a new or working truck for the lab that has A/C and is reliable (won't leave us stranded on the side of the road like the last three times). Our 1999 Ford F-150, and 1996 Ford 250 are both on their last leg. *Jennifer Berry, GA*

A wonderful gift from Santa would be the uncapper from Simple Harmony Farms. The one where you pass the frame through two spiked rollers and the cappings are sliced. I think it will fit down the chimney just fine. *Ann Harman, VA*

Time . . . lots of free time. Never enough of that. *Kim Flottum, OH*

Question 1 What do you do with a dead out this time of year when you find it?

If it died from a disease/pest, I'll close it up and let it kill itself out, or burn it/blow it up/set it on fire in some fun explosion way. If it's salvageable, I'll take it apart and use on other hives or use the boxes to add to our shooting range. *Jessica Louque, NC*

If it has honey, I generally put it on another hive that's running light. *Ed Colby, CO*

When we find a dead out, we immediately take it back to the lab. Here in the South small hive beetles have probably invaded any wax comb with honey or pollen. If so, we teepee the frames in full sun to kill the beetle larvae. If the frames/hives are full of wax moths, we scrap them clean. If foundation is still useable we place in an open aired shed with plenty of sunlight, a walk-in cooler or freezer for safe keeping. But with chilly weather almost here, leaving wax frames outside protected from

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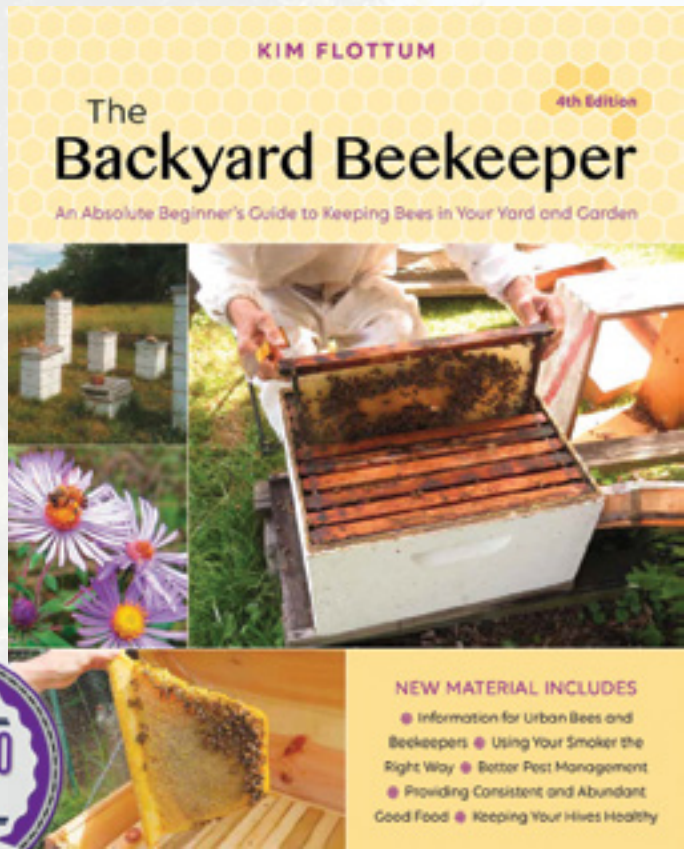
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FOUND IN TRANSLATION

Pros And Cons Of Middle Age

Jay Evans, USDA Beltsville Bee Lab



It is well known that honey bee workers work inside the hive for the first week of their lives, with occasional tentative flights for those which are more precocious. By the end of their second week as adults, the healthy ones will start flying on a regular basis and, with luck, they will begin to bring pollen, nectar, resins, and water home against formidable odds. Thanks to two recent studies that have pushed the technology for ‘helicopter beekeeping’, we now know quite a bit more about how bees perform as foragers.

Simon Klein, with colleagues on three continents, has described a fascinating study of the foraging careers of hundreds of worker honey bees. While this study can’t really answer the key question of how bees die, the authors provide odds of death that would make insurance agents green with envy. They also describe the food incomes for both typical and atypical (or ‘elite’) foragers. The study is freely available at Scientific Reports under the title “Honey bees increase their foraging performance and frequency of pollen trips through experience” (2019, <https://doi.org/10.1038/s41598-019-42677-x>).

As the title implies, the first message is that foragers seem to get better at what they do as they age, good news for those of us who plan to work until we are found on our backs in the grass. They discovered this by using one of the most complex ‘hive-monitoring’ schemes yet. First, thousands of newly emerged bees in each of two colonies were geared up with tiny Radio-frequency identification (RFID) tags on their backs. These tags weigh only 1 mg, or 1/2000th of a U.S. dime (1% of a typical worker bee’s weight, superglue included). They are unique

to each bee and trip an RFID antenna every time that particular bee passes by. The investigators then set up two one-way tunnels for the bees, one leaving the hive and one returning, by channeling bees with tubes equipped with opposing plastic bristles. Finally, these in- and out- express lanes were equipped with high resolution video cameras and balances to allow a visual inspection for pollen loads and a weight measurement to determine the success and failure of each trip. Fully geared up, the bees were set loose in Australian pastures.

The first surprise to me was how few foraging trips the average bee makes during her lifetime. Bees from the two colonies used in this study clocked 17 and 21 trips on average, respectively, and only rarely kept at it for more than a week. In fact, the average effective forager lifespan from these trials from first true foraging trip (> 10 seconds in duration) to lights out was under five days. During these trips, only one quarter of the bees returned with pollen at least once, and all bees that were observed returning with pollen had at least one additional trip where they returned with just nectar, water, or no food at all. It was challenging to determine precisely how much food was harvested per trip, since departing bees both burned energy and likely defecated while on their journeys.

On the topic of old age and experience triumphing over youthful energy, Klein and colleagues found that bees steadily increased their rate of successful trips up until day nine of foraging, if they were lucky enough to live that long. They also carried back larger loads, and more frequently returned with pollen. Why is this, when surely the energetic costs and various environmental

hazards of foraging surely must accumulate? Are older bees more ‘fit’ perhaps because of prior journeys across the landscape? Or are they simply better able to locate and efficiently gather up food from flowers and make it home efficiently? Bees are known to refine their abilities to sniff out flowers over their foraging lifespans, and this perhaps best explains the higher success rates of older foragers.

Abby Finkelstein and colleagues in Arizona and Germany provide a beautiful exposé of this fact in another open-access paper “Foraging experiences durably modulate honey bees’ sucrose responsiveness and antennal lobe biogenic amine levels” (2019, <https://www.nature.com/articles/s41598-019-41624-0>). This study relied on a key test used to assess the learned and innate honey bee responses to signals in their environment, the ‘Proboscis Extension Response.’ This test is the honey bee equivalent of Pavlovian drooling, whereby individual bees are constrained and then exposed to a variety of cues ranging from tactile (perhaps sugar solutions brushed against one of their antennae) to airborne (any number of smells, from bomb residues to queen pheromones and floral scents). Exposed bees ably perceive and learn from these cues and, when the cues are linked to a food reward, respond by uncurling their proboscis ‘tongues’ to feel for that food.

Finkelstein and gang did not measure foraging directly, but instead established split cages of worker bees where all bees were in contact via gaps in a mesh screen but half of the bees were allowed to ‘forage’ on internal feeders while the other half received food only by mouth-to-mouth feeding from those

foraging bees, through the mesh screen. They added a bit of aversive conditions for some of the foraging bees (a mild electric shock). This is a standard tool for determining just how influential a learned cue is on bee behavior, since even bees are hesitant to do something when pain is part of the reward.

They then divided food (sucrose solution) sources into those with a floral scent and those without, and used these same scents as the triggering cue for bees asked to extend their proboscis tongues. Both foraging and confined bees showed an increased proboscis response to sugar scented with floral cues, but this response was substantially stronger for the forager bees, where scented nectar gave a threefold higher response rate than unscented nectar. This recall of floral scents was even stronger over time, with 'forager' bees that were tested several days later showing a higher response rate to scented foods. As evidence that these bees really had 'tuned' their senses to the best available cues, bees trained on a floral scent were actually less responsive to straight sugar than were bees which only knew pure sugar from the start. These learned biases were not evident in bees exposed to mild shocks, nor in bees which only received food from their nestmates, despite the fact that nestmate-fed bees presumably tasted

the floral scents when they received food from the honey stomachs of their sisters.

Back to the great outdoors, could the higher rate of successful trips reflect learned cues from specific patches of flowers? Bees certainly use scents to key in on patches of flowers (if they didn't, flowers would not spend so much energy making these scents), but can bees become specialists over time, making a bee-line straight to familiar scents? Maybe. One other fascinating tidbit from the Klein study was the affirmation of 'elite' bees, which collected disproportionately high resources, both in terms of their number of trips and yields of nectar

and pollen per trip. Building on this, it will be fascinating to see how well elite bees were targeting scents or individual patches that had been winners in the past.

Curious minds will want to know if these elite bees represent specific genetics (patrilines) or perhaps received lucky breaks in terms of their own nutrition or avoidance of abundant chemical or disease stresses. These studies and more, including rampant helicopter beekeeping by hobbyists and commercial beekeepers using a range of publically available spying devices, will continue to shed light on what defines a good life for a worker bee. **BC**


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Honey bee larvae produce two different pheromones: brood pheromone and E- β -ocimene. Brood pheromone is found on the cuticles of larvae, a blend of 10 simple fatty-acid esters and they are described as important compounds in the chemical communication between brood and workers. These esters include: ethyl linoleate, ethyl linolenate, ethyl oleate, ethyl palmitate, ethyl stearate, methyl linoleate, methyl linolenate, methyl oleate, methyl palmitate and methyl stearate (Le Conte et al. 1990). E- β -ocimene is a pheromone with two actions on workers physiology: inhibition of worker ovaries (Maisonnasse et al. 2009) and acceleration of workers behavioral maturation (Maisonnasse et al. 2010).

“Both larval pheromones cause both primer and releaser effects on the honey bee population (Ma et al. 2019). Pheromones are typically categorized by the time scale at which they induce behavioral changes in receivers: primer pheromones cause slow, enduring changes in physiology, while releaser pheromones cause rapid ephemeral (lasting for a very short time) responses. Primer pheromones generate long-term changes in behavior and physiology by altering patterns in gene expression, especially in the brain (Ben-Shahar et al. 2002; Grozinger et al. 2003; Alaux and Robinson 2007; Alaux et al. 2009a; Alaux et al. 2009b). In contrast, releaser pheromones elicit rapid behavioral changes either by activating or modulating neural circuits, triggering molecular signaling pathways, or regulating gene expression (Alaux and Robinson 2007; Slessor et al. 2005; Whitfield et al. 2003; Lutz and Robinson 2013).”

“Brood pheromone (BP) and E- β -ocimene (EBO), have been shown to elicit rapid increases in pollen foraging within an hour of exposure and lasting for three hours. Both pheromones are produced by developing larvae but differ in the timing of their peak production, such that EBO is produced early in larval development while BP is produced later on, just before pupation (Beggs et al. 2007). Both larval pheromones cause additional behavioral and physiological effects in honey bee workers. In fact, brood pheromone induces the greatest number of known primer responses in honey bees, including modulation of sucrose response thresholds, ovary development, foraging ontogeny, foraging choice behavior and hypopharyngeal gland development (Pankiw 2004a). The effect of brood pheromones on forager behavior seems to be driven by an increase in pollen foraging. Specifically, brood pheromones cause an increase in the number of foraging trips and the size of pollen loads (Beggs et al. 2007; Pankiw 2004b), and this effect is not driven by task-switching from nectar to pollen foraging (Beggs et al. 2007). Both pheromones also increase the size of the foraging force of the colony in the long term, accelerating the transition of bees from performing within-hive roles to foraging (Pankiw 2004b; Traynor et al. 2015; Ma et al. 2016). Interestingly, some components of EBO and BP are also produced by honey bee adults as well. For example, EBO is also produced by mated queens (Gilley et al. 2006), and foragers produce ethyl oleate, a component of BP (Leoncini et al. 2004); both impact the ontogeny of foraging behavior (Leoncini et al. 2004; Maisonnasse et al. 2010). Queens and larvae both produce another BP component, ethyl palmitate, which inhibits ovarian development (Slessor et al. 2005). Although BP components are also produced in adults,



A Closer LOOK



LARVAL PHEROMONES

Clarence Collison

Both larval pheromones cause both primer and releaser effects on the honey bee population.

the full blend of BP and EBO has only been described in honey bee larvae, and multi-component pheromone blends often have synergistic effects (Slessor et al. 2005). Overall, larval pheromones have a strong effect on pollen foraging but not nectar foraging in the short term (i.e., hours), and they are also involved in regulating the size of the foraging labor force in the long term (i.e., weeks).”

“He et al. (2016) investigated whether honey bee larvae actively signal their food needs pheromonally to workers. They showed that starving honey bee larvae signal to workers via increased production of the volatile pheromone E- β -ocimene. Analysis of volatile pheromones produced by food-deprived and fed larvae with gas chromatography-mass spectrometry showed that starving larvae produced more E- β -ocimene. Behavioral analyses



Primer pheromones cause slow, enduring changes in physiology, while releaser pheromones cause rapid ephermeral (lasting for a very short time) responses.

showed that adding E- β -ocimene to empty cells increased the number of worker visits to those cells, and similarly adding E- β -ocimene to larvae increased worker visitation rate to the larvae. RNA-seq and qRT-PCR analysis identified three genes in the E- β -ocimene biosynthetic pathway that were upregulated in larvae following 30 minutes of starvation, and these genes also upregulated in two-day old larvae compared to four-day old larvae (two-day old larvae produce the most E- β -ocimene). This identifies a pheromonal mechanism by which brood can beg for food from workers to influence the allocation of resources within the colony.”

In a colony, brood stimulates development of the hypopharyngeal glands of nurse bees. Mohammadi et al. 1996 demonstrated that BP, the blend of 10 esters, ethyl oleate, and methyl palmitate stimulates protein synthesis in hypopharyngeal glands of nurses. Thus, the chemical signal from the brood acts as a primer pheromone in addition to its previously shown role as a releaser pheromone to nurse bees, as they feed larvae.

“Le Conte et al. (2001) reported that BP, which has been shown to be a kairomone (an attractant to *Varroa* mites), a releaser and a primer pheromone, also acts as a primer pheromone in the regulation of division of labor among adult workers. Bees in colonies receiving brood pheromone initiated foraging at significantly older ages than did bees in control colonies in five out of five trials. Laboratory and additional field tests also showed that exposure to brood pheromone significantly depressed blood titers of juvenile hormone. Brood pheromone exerted more consistent effects on age at first foraging than on juvenile hormone, suggesting that the primer effects of this pheromone may occur via other, unknown, mechanisms besides juvenile hormone. These results bring the number of social factors known to influence honey bee division of labor to three: worker-worker interactions, queen mandibular pheromone and brood pheromone.

“The 10 fatty acid ester components of brood pheromone were extracted from larvae of different populations of USA and South African honey bees and subjected to gas chromatography-mass spectrometry

quantitative analysis. Extractable amounts of brood pheromone were not significantly different by larval population; however, differences in the proportions of components enabled them to classify 77% of the larval population samples correctly by discriminant analysis. Honey bee releaser and primer pheromone responses to USA, Africanized and-European pheromone blends were tested. Texas-Africanized and Georgia-European colonies responded with a significantly greater ratio of returning pollen foragers when treated with a blend from the same population than from a different population. There was a significant interaction of pheromone blend by adult population source among Georgia-European bees for modulation of sucrose response threshold, a primer response. Brood pheromone blend variation interacted with population for pollen foraging response of colonies, suggesting a self recognition cue for this pheromone releaser behavior. An interaction of pheromone blend and population for priming sucrose response thresholds among workers within the first week of adult life suggested a more complex interplay of genotype, ontogeny, and pheromone blend” (Metz et al. 2010).”

“Brood pheromone, previously described as important compounds in the chemical communication between brood and workers, was tested as an additional chemical stimulus in the artificial rearing of queens. Three compounds significantly affected queen rearing when they were applied in amounts similar to those naturally found on the larval cuticle. Methyl stearate increased the acceptance of the queen cells, methyl linoleate enhanced the amounts of royal jelly deposited by the worker, and methyl palmitate improved the weight of the larvae (Le Conte et al. 1995).”

Honey bee division of labor proceeds along a stereotypical ontogenetic path based on age, modulated by various internal and external stimuli. Brood pheromone is a major social pheromone of the honey bee that has been shown to affect honey bee division of labor. It elicits several physiological and behavioral responses; notably, regulating the timing of the switch from performing in-hive tasks to the initiation of foraging. Additionally, brood pheromone affects future foraging choice. In honey bees, sucrose response threshold is a physiological correlate of age of first foraging and foraging choice. Brood pheromone has been shown to modulate sucrose response threshold in young bees, but its effects on sucrose response thresholds of bees in advanced behavioral states (foragers) are not known. Metz et al. (2018) examined the sucrose response thresholds of two different task groups, foragers (pollen and non-pollen) and non-foraging bees, in response to honey bee brood pheromone. Sucrose response thresholds were not significantly different between brood pheromone treatment and controls among both non-pollen and pollen foragers. However, the sucrose response threshold of

Brood pheromone induces the greatest number of known primer responses in honey bees.



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Overall, larval pheromones have a strong effect on foraging in the short term (i.e., hours), and they are also involved in regulating the size of the foraging labor force in the long term (i.e., weeks).

non-foraging bees was significantly higher in the brood pheromone treatment group than in the control group. The switch to foraging task is considered a terminal one, with honey bee lifespan being determined at least partially by risks and stress accompanying foraging. Their results indicate that foragers are physiologically resistant to brood pheromone priming of sucrose response thresholds.

Fatty acid esters extractable from the surface of honey bee larvae (BP), significantly increase rate of colony growth in the Spring and Summer when flowering plant pollen is available in the foraging environment. Increased colony growth rate occurs as a consequence of increased pollen intake through mechanisms such as increasing number of pollen foragers and pollen load weights returned. Pankiw et al. (2008) tested the hypothesis that addition of brood pheromone during the Winter pollen dearth period of a humid subtropical climate increases rate of colony growth in colonies provisioned with a protein supplement. Experiments were conducted in late Winter (9 February-9 March 2004) and mid-Winter (19 January- 8 February 2005). In both years, increased brood area, number of bees, and amount of protein supplement consumption were significantly greater in colonies receiving daily treatments of brood pheromone versus control colonies. Amount of extractable protein from hypopharyngeal glands measured in 2005 was significantly greater in bees from pheromone-treated colonies. These results suggest that brood pheromone may be used as a tool to stimulate colony growth in the southern subtropical areas of the United States where the package bee industry is centered and a large proportion of migratory colonies are overwintered.

“Sagili and Pankiw (2009) examined responses of the queen, queen-worker interactions, and nursing behaviors to an increase in the brood rearing stimulus environment using brood pheromone. Colony pairs were derived from a single source and were headed by open-mated sister queens, for a total of four colony pairs. One colony of a pair was treated with 336 µg of brood pheromone and the other a blank control. Queens in the brood pheromone treated colonies laid significantly more eggs, were fed longer, and were less idle compared to controls. Workers spent significantly more time cleaning cells in pheromone treatments. Increasing the brood rearing stimulus environment with the addition of brood

Brood pheromone is a major social pheromone of the honey bee that has been shown to affect honey bee division of labor.

pheromone significantly increased the tempo of brood rearing behaviors by bees working in the nest resulting in a significantly greater amount of brood reared.”

“Smedal et al. (2009) demonstrated that brood rearing reduces worker vitellogenin stores and colony long-term survival. They also established that these effects can result solely from exposure to brood pheromone. These findings indicate that molecular systems of extreme lifespan regulation are integrated with the sensory system of honey bees to respond to variation in a primer pheromone secreted from larvae.” **BC**



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A close-up photograph of a beehive frame. The frame is made of light-colored wood and is filled with bees. Some bees are on the frame, while others are flying around it. The background is dark and out of focus, showing more of the hive structure.

Are You Listening?

NOTES FROM THE BOARD

Apis M. Mellifera

On Professionalism; On Bears

On the heels of my last letter concerning queen excluders, the board of directors wishes to convey its collective opinion about professionalism in the beekeeping industry. The national publications dealing with the trade are rife with advertising, bordering at times on the ridiculous. In another industry, some of these might be called more than unethical, and perhaps be punishable under a number of fair business practice statutes. Such advertising does no credit to the beekeeping community and, also, contributes to a lack of self esteem among beekeepers and us bees alike.

Even as recently as a few months ago, for example, one publication featured in a section usually geared to publishing factual material what appeared at first glance to be a breakthrough in the feeding of honey bees. After having this read to us by our beekeeper, however, we concluded it was nothing more than an advertisement promoting a product on the flimsiest of evidence. The article in fact was authored by the very person in the business of selling the product, who cited himself in one place in the references as, “unpublished results”.

The author did reference one scientific study which appeared to corroborate his own conclusions about the product, from which we quote: “Diets with brood-diet ratio of 1.0 or greater must be considered as most promising.” The product did indeed fit the specifications. The quoted study, however, does not go on to recommend the product, but suggests two other diets were most favorable in

terms of availability and cost. Finally, the author of the advertisement makes the outlandish statement that this product “successfully overcomes the resistance of honey bees to consume pollen substitutes.” Unfortunately, no proof of this is cited in the references, leaving the customer to ponder how this could be so in light of literally decades of futile research by a wide variety of scientists on this very subject.

This is just one of the blatantly overstated kinds of promotion found in many bee publications, which makes the beekeeping industry one of the best bastions of the rule, “*caveat emptor*,” let the buyer beware. Other examples are legion, especially with reference to stock and/or queens as “tested,” “Winter hardy,” “hybrid” or “pure Carniolan”, without a shred of supporting evidence.

A recent development called the “flow hive” appears to fit the model described above. There has been a huge “buzz” over this, which continues to be one of the better-performing campaigns on the crowd funding platform known as Kickstarter.com. However, we continue to wait for controlled studies looking at this hive’s advantages versus its disadvantageous. At the moment all we can point beekeepers to is a wikipedia page, which features this reflection: “This section may lend undue weight to a small group of bloggers. Please help improve it by rewriting it in a balanced fashion that contextualizes different points of view.”

In view of all of the above, we honey bees can only ➦

recommend that advertisements which guarantee to totally prevent swarming, or somehow solve other time-honored problems in beekeeping, should also be taken with more than a grain of salt. Some persons, no doubt, have superior queens in their opinion, or excellent experience in advanced techniques in honey bee management, along with fantastic production results on which such advertising is based. But it behooves the beekeeper not to take claims at face value, and to always ask for supporting evidence.

One rejoinder we continually hear is that in reality most beekeepers are not professionals, but lumped into a category called "hobbyist." So be it, but many part-time beekeepers have another profession to relate to which has promulgated a certain code of behavior. There's little reason to suggest that because there are so many hobbyists and part-timers, the beekeeping profession should somehow be exempt.

In conclusion, we bees urge a hard look at advertising in the beekeeping field, as in other professions. We realize publications cannot possibly separate all the promotional "wheat from the chaff," but we cannot condone that a prominent disclaimer clause is often lacking in much current advertising.

On Bears

It is not often we bees come to the defense of our enemies. But in this complex world at times, the shoe is on the other foot, and an enemy indirectly becomes a friend. The board of directors, therefore, has asked me to give you our analysis of the relationship between honey bees and bears.

Frequently at bee meetings the remark is made that the only good bear is a dead bear. This is strong talk and stems from a like emotion. It reflects the visual and other sensory impact when one enters a beeyard that has been visited by a marauding bear. The mammal leaves a great deal of carnage in its wake, strewing equipment everywhere in search of its favorite foods, our honey and

our brood.

Being on the receiving end of the predator-prey relationship, we bees naturally take a dim view of bears. However, these furry beasts, although not insects, have much in common with us. It appears, sad to say, we may need bears perhaps more than they need us.

Actually we bees see humans as more at fault in this than our shaggy nemesis. Bears after all bring bees closer to them than nature ever intended in this human-managed modern world, now called the Anthropocene. We need them as much as they need us due to effects of drastic urbanization, forest clear-cutting, large-scale agriculture and expansive highway construction squeezing us into smaller and smaller habitats. The inevitable effect of all these activities is potentially more bear and bee interaction, resulting in bad news for bears, beekeepers, and honey bees.

We definitely would like to see bear depredation be reduced, but not at the expense of eliminating the bear. Like it or not, we bees are a minority and our work, valuable though it is, largely goes unnoticed. Bears on the other hand are harder to ignore. They're bigger, louder and lots of children play with stuffed animals modeled on them. We know few human children that play with stuffed honey bees? So if bees are killed off by pesticides or bears, who beside we and the beekeeper knows or cares? But let it be known that bears are disappearing or not well cared for and see the result.

Good bear habitat is usually good bee habitat. And bears require a lot of room. Saving bear habitat and thus preserving natural areas for them is a positive step in conserving bee forage from depredation by humans. So in answer to the question, can we live with bears? We say yes. We have coexisted with these creatures for a long time. Though they may be responsible for eating some of our honey and brood, we can live with that. And perhaps you haven't noticed that one of the most popular honey bottles, marketed for human consumption, comes in the shape of a bear. **BC**

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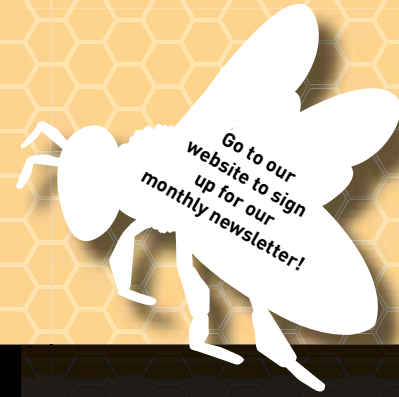
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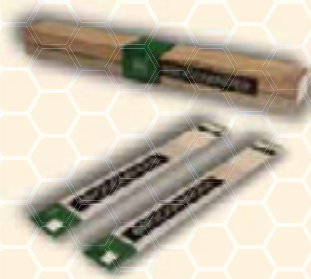
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Detroit Hives' Nicole Lindsey and Timothy Paule

Toni Burnham

All beekeeping is local, even urban beekeeping. And urban beekeepers? Among ourselves, we certainly see differences between sites on rooftops and in parks and can smile at being looked at like heroes. To the public, and to beekeepers in other settings, we probably seem pretty similar, however.

But we really aren't. My bees live in a city where green movements are often associated with long term residents having to leave their neighborhoods at about the same pace that newcomers establish community gardens. To some long-term residents, we may look like an invasive, non-native species. In "boom" cities, it's also harder to find apiaries, as both empty lots and garden spaces get developed into buildings, and the chance to keep bees for the folks who aren't being lifted by the boom fades.

Nicole Lindsey and Timothy Paule of Detroit Hives, however, have proven in just a couple of years that beekeeping *can* help restore existing urban communities, and that greening, like beekeeping, can belong to everyone. Unlike most beekeepers, they conceived this project as public from the beginning. That created something special: a mission that extended from their own personal, physical and spiritual well-being to that of an entire city – including native and managed pollinators. The connections and possibilities just keep growing.

"We've been doing this for two years and four months, and I won't count the seconds or the minutes. So we're fairly new to this. But one of the things that honestly excited us is that it is really interesting to learn about bees! It's also therapeutic, and truly calming. We get excited about learning something new, and sharing it," says Timothy Paule.

Detroit Hives is re-growing the city, and building up its residents, their neighborhoods, and entire communities. And the honey is *dope*.

It could have been peacocks, but then he got a cold

Timothy Paule and Nicole Lindsey, co-founders, are natives with a deep commitment to their hometown. Nicole also points out, "we also seek spiritual connections, approaching things with a spirit of 'yes.'"

Making Detroit "The Place To Be"

Detroit, however, is a community fighting back from a long decline. The city lost 60% of its population in the decades since 1950. Today it has 75,000+ vacant lots with no budget for rehabilitation. However, through the Detroit Land Bank Authority it's now possible to acquire vacant lots at low cost. Mr. Paule and Ms. Lindsey began to develop a course of action.

Timothy, who is a professional photographer, shares, "Nicole and I wanted to create a unique experience that you couldn't find in the city of Detroit, so community residents could take advantage of it. We thought about starting a peacock farm, an urban camp, or an outdoor photography studio."

Says Paule, "I'd been in the for-profit world for about 12 years, being creative behind the scenes. It was great for a while, but I was spending hours and days and weeks staring at a computer screen, and it was weakening my eyes."

"I wanted to find natural ways of curing myself, like sun gazing and the practice of grounding – taking off your shoes and placing your feet on sun-charged earth. I also wanted to be more optimistic: I was a little depressed and had lost a lot of family."

"In learning to be more spiritual, and more grateful, I learned that I had to be in nature. While sungazing I would hear the birds chirping: I wanted to be *outside*."

Then, in December 2016, Paule got a cough and cold that wouldn't quit, the usual remedies not helping. A Ferndale store owner took pity and gave him a jar of local honey and an education in its health benefits. Paule got better, then he and Lindsey decided to learn more about bees and honey.

"It wasn't until I got sick that we came across the idea of local, raw honey, because that's what helped me. That idea began to grow beyond just providing honey for myself. There's opportunity to educate people about raw honey, but you can't do that without educating them about honey bees and how they make it. They have to spiral in deeper and deeper, and that's when we formed Detroit Hives," Timothy shares.

"When we started, the city had more than 90,000 vacant lots. We wanted to do something cool, we wanted to do something to bring the community together, we wanted to do something to address issues of blight."

Nicole adds, "There was a problem that we see in our city, there was a problem that we see in our bees. What we are doing here is solving both of those problems."

Work hard, stay bumble

In early 2017, Lindsey and Paule decided to start an urban bee farm for the community “to experience, firsthand, honey bees, conservation, and their role in our ecosystem.” But things went a bit faster than planned.

“At first,” says Timothy, “We didn’t know where to start. We didn’t even know what the title was for this particular job or industry. We had to Google apiculture, apiology, all that jazz. We came across two local beekeeping associations: the Michigan Beekeepers in Kalamazoo, a couple of hours away, and the Southeastern Michigan Beekeeping Association in Livonia, only 30 minutes. In March we contacted their president, Roger Sutherland, who has since passed.”

“We said, ‘We are so excited, we want to create these bee parks, but we need to take courses!’ He told us that we would love for us to study with them, but the classes were full!”

“He recommended two classes that were closer: one from Green Toe Gardens – a single day, eight-hour session, followed by hands-on courses. The second class was a ‘Sweet on Detroit’ course over three months with hands on experiences and a certification. We figured that it would be great to take both.”

Nicole mentions, “One of the reasons that we took the second course was that we felt a day of instruction wasn’t enough, and we wanted more experience and a certification. Three months may not be enough instruction, is that, you know?”

“There is nothing they can teach which is like actually keeping bees. You can learn and learn and you can get over fears. You can make a lot of mistakes from just doing it.”

Timothy mentions a surprise that moved things forward, fast: “When we took the one-day course, it turned out we were in for a treat! At the end, they wanted us to have bees. “

Nicole: “We were like, ‘No, we are NOT ready to keep bees! We just took one course!’”

Timothy: “But the teacher had already ordered them, and she was really instrumental in getting us to be bee parents really early!”

Timothy remembers, “We were in a place where we were trying to say ‘yes’ to the universe. We’d said ‘yes’ to the course, ‘yes’ to a park, and so we said ‘yes’ to the bees, even though we were not ready for them.”

Having bees of their own made a big difference during their second course! “It was great, because we could ask all these questions, and we had our bees we could go back to our apiary and do everything that we learned in class and apply it,” says Nicole.

“So we had all the classes, we had the hands-on experiences, and then the class had a bee club. We got extended support: there were several beekeepers who had taken the course who were there to provide advice and mentorship,” adds Paule.

“‘Sweet on Detroit’ is a city program under the Keep Growing Detroit initiative, and it was hands on. We would go inside the hives to learn how to work bees: that type of hands on made it a whole lot easier and made us a whole lot more comfortable.”

First apiary

At first, Detroit Hives set up on land that was not yet theirs. According to Nicole, “We started with two



Volunteers from across the city have helped build and sustain Detroit Hives operations at nine current sites.

hives from packages, and then we started a third from a nuc about a month later. We found that the nuc was a lot easier to start, but with a package you get all the experiences – dumping bees in, finding the queen cage, making sure that you have the marshmallow in right, checking on release.”

Timothy notes: “Nicole actually installed the packages the first time, by herself!”

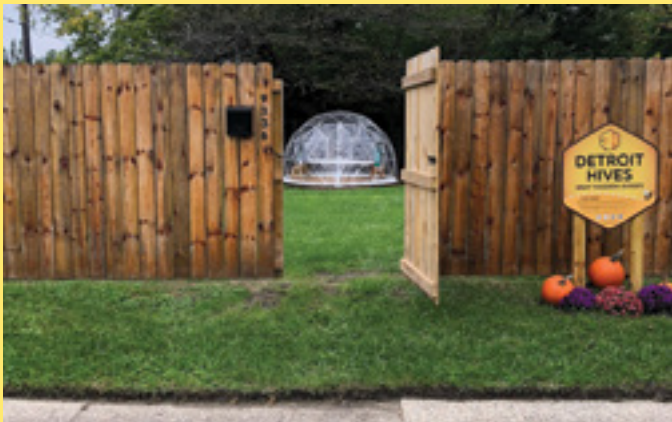
Paule adds, “What’s great about this project is that it also includes a role for native bees. There are so many native plant species in these vacant lots that it has already been proven that it is boosting bee populations.”

The seed money for their first apiary came from a grant from Detroit SOUP, a community group which selects grantees who make pitches at a large dinner gathering. Since then, Detroit Hives has actively sought and received grants and regular volunteer support to acquire bees, equipment, land, and to improve and build on their lots. Their East Warren Apiary was a blighted, abandoned lot that they improved with fencing, murals, and an eco-dome to facilitate all-weather education, done substantially with the help of volunteers.

Don’t ask, don’t tell

Though not the first beekeepers in the city, Detroit Hives was the first to establish a public apiary. Timothy explains, “Keeping bees in Detroit is being reevaluated. Right now, they are considered livestock. If there are complaints, you will probably have to shut down.”

“When setting up, it truly was a ‘don’t ask, don’t tell’



In the East Warren neighborhood, Detroit Hives transformed a barren lot into a vibrant apiary and educational space.

situation. There was no model in place for apiaries in the city. What's good about our project is that we put it on vacant land. A lot of these areas have blocks and blocks of vacancies, so there are few neighbors to complain."

Lindsey adds, "When we first started, the neighbors were so excited that we were actually cleaning up the lots and clearing out the blight . . . They were grateful that we were cleaning and beautifying the neighborhood. Vacant lots are really hurting the community."

Paule confesses, "The thing is, you *do* get neighbors who aren't excited about bees. It's about 50/50, people excited and people afraid. Some just misidentify bees as wasps or hornets. We have lots of neighbors who know about both honey bees and native bees and understand their value and importance. They have flowers and they have gardens themselves, and they see that they can increase their yields by having bees. They are also excited for their children having an outdoor place for learning. They can see the bees, get hands on experiences, all within walking distance."

Detroit Hives is also an innovative user of Airbnb Experiences: the popular lodging platform matches them with visitors who pay for apiary visits and the experience of inspecting a hive. Exciting, memorable education and outreach is a contributor to their economic sustainability.

Detroit Hives currently has apiaries that range from



Detroit Hives colonies produce between 50 and 70 pounds of honey each season.

four colonies to single hives, more and more placed at sites where the bees support the work of partner organizations that are providing fresh produce in "food desert" areas.

"We now have 35 hives at nine locations in the city of Detroit: vacant lots, schools, and community gardens." Their goals are much greater: they would like to have 200 hives in 45 locations within five years.

"At every single location, we are planning to create educational wildflower pollinator habitats. There will be spaces where children can plant flowers: we want to establish a garden club that is responsible for maintaining the habitat at each location. It creates ownership, sustainability and hope."

A buzzing, green future

Lindsey and Paule want to continue to grow their experience and skills, and to work with partners like BeeInformed and research universities to bring more knowledge in and share their lessons elsewhere. Both want you to know, "We do have a five-year goal and plan in place. Detroit Hives wants to establish a Learning Center in order to teach all year. Most of our educational opportunities are now outside, but we need a facility in order to teach year-round."

For that and to get to 45 locations, "We will need lots of partners, lots of funders, and also beekeepers to help.



Nicole Lindsey and Timothy Paule, co-founders of Detroit Hives.

Recognition

In October, Detroit Hives was named NAPPC Pollinator Advocate USA 2019, the latest of many awards. The Pollinator Advocate Award recognizes individuals or organizations that have contributed significantly to pollinator species protection and conservation and to public education, resulting in increased awareness of the importance of pollination.

This recognition joins others, including “The Spirit of Detroit,” Keep Michigan Beautiful’s “President’s Plaque,” the 2019 Impact Award from EarthX Film, and their recent “Best Fun Spot” trophy from the Detroit Eastside Network!

You can hear their voices, too: watch a short movie about Detroit Hives at https://www.youtube.com/watch?v=h_2GMBjKxNQ

We can’t do it all ourselves: we want to hire experienced beekeepers to train others to manage our hives. We already know what it will look like, we already know where

we want to place it, right now we need to attract those funders and the dollars to make it happen.”

In interviewing Timothy Paule and Nicole Lindsey, it was astonishing how their roots in the city, ties to each other and the community, and sense of history and the future are seamlessly interwoven. Their work and that of their bees is already educating children, putting fresh produce on the plate in homeless shelters, increasing yields in community gardens.

Nicole quickly added, “We know Detroit will not have lots of vacant lots forever. We want to be sure that the city has the green infrastructure necessary to support the honey bees and native bee population in the future.”

Timothy: “We have launched a campaign, ‘Detroit is the Place to Bee,’ and are working to become a Bee City USA. Support in general from the beekeeping community, including letters of support for bee city, would be amazing!”

“As Detroit natives, we feel that we have been a bee city for a few years, we just want to make it official!” **BC**



LESSONS FROM A JUNIOR BEE CLUB

David Donnelly

The Treasure Valley Beekeepers’ Club (TVBC) in Boise, Idaho is full of enthusiastic members and presenters, with upbeat and informative meetings. But that was not enough to keep the attention of the kids who accompanied their parents to the meetings. The kids would be finishing their homework, playing video games, and basically looking bored. So Michele Donnelly, my wife and beekeeping partner, thought, what if we offered a meeting to teach them about bees and beekeeping, a meeting geared towards them. She decided to do something about it.

She started TVBC’s Junior Bee Club, for kids ages 5-14, which runs concurrently with the club’s regular meetings, in an adjacent room of our meeting hall. She is quick to point out that she and her volunteers are *not* there to babysit. They offer real life lessons for budding young beekeepers, often to the envy of the adults who wish they could join in where the fun is taking place.

Michele found out that guidelines or lesson plans on how to begin such an endeavor were few and far between. Over the past two years, she discovered through trial-and-error, what worked, and the best way to engage these youngsters. And how to keep them coming back for more.

With initial monthly attendance in the two to four range, it was slow catching on. But by the time attendance reached a steady 20-25 kids, she knew she had a winner.

TVBC invested money in the efforts for monthly projects and supplies. Teaching and encouraging the next generation is an important mission of the club. Our new meeting place is at a local Eagles Lodge. They only allowed us to use their facility after they learned how much time and effort the club puts into educating kids, along with their community events as well.

Michele is a beekeeping enthusiast and a grandmother. She’ll be the first to tell you that she has never been a school teacher. She constantly asks herself, “How do I keep young people engaged, especially when their age range is so wide?” Part of the answer came with help from a few of the volunteer-members who had teaching experience. And from our daughter Caitlin, who knows very little about bees, but teaches elementary school.

Caitlin’s most helpful advice? Have the kids do hands-on activities, and switch it around every 20





minutes. With this advice and Michele's own ideas, the evening's activities must always be fun to keep the kids engaged. A typical evening's session of about one hour and 15 minutes might go like this:

- Begin with a short Youtube video or Power Point for kids on the topic of the evening (mites, pollinating, bee anatomy, whatever);
- Divide the kids into two or three groups (five to seven kids per group). Sometimes the divisions are by age, although it also works good to pair a younger and an older kid together for some activities;
- Set up each group at a different table or work station, with an adult volunteer manning each station, rotating the groups every 20 minutes or so.
- Vary the stations between science and craft activities, depending on the topic of the evening, always with a focus towards hands-on learning.

In no special order, here are some typical activities that have been included in recent meetings:

- Look at mites or bee parts under microscopes, and draw them out (we were fortunate to have some microscopes donated by a local school and a generous club member);
- Pull apart a flower, tape the pieces of the flower onto a piece of paper, and label the stigma, anther, and so on, to learn about pollinating;
- Name and assemble the various wooden pieces that constitute a bee

hive, to understand how they work together, and then assemble deep hive frames;

- Design and paint bee boxes (we used cardboard banker boxes, which they took home). This was an art project that encouraged the artistic side of the kids;
- Learn about pheromones by giving each kid one of four different "scents," which came from aromatic oils on cotton. They had to go around the room, without talking, and find the other members of their colony based upon scent;
- Uncap frames of honey, then extract, filter, bottle, and draw their own designer label to place on their bottle. Each kid got to take home an eight-ounce jar. The frames of honey were donated by the bee club;
- Examine large photos of comb and describe what they see, i.e. brood, honey, nectar, or pollen patterns, healthy or unhealthy, etc.
- Learn why nature prefers hexagons, the shape of comb cells, by blowing bubbles with soapy water and seeing how hexagon shapes form naturally.
- Dissect bees, make microscope slides, and examine parts such as wings, legs, and stingers under the microscope.

Of course, there is only so much that can be done in an evening "classroom" environment with limited time. So the highlights of the year for the kids came on the two field days, when the kids visited a working apiary and engaged with real bees. The first

field day this year was in Spring, so the kids installed packages and queens. They did it all, with some guidance. Then in late Summer, they saw the progress in the same hives and pulled frames of honey from the supers. This took place prior to extracting at a later meeting.

Not surprisingly, a large number of the kids already have experience with their family's bees. They can be quite knowledgeable, as well as helpful towards the other kids that don't have bees yet. The meetings are of course non-competitive, and the older kids can be quite helpful with the younger ones. Michele was so happy when one of her junior beekeepers said, "I used to be afraid of bees, but now I'm not."

When the monthly meeting or field day is over, Michele begins vigorously developing the lesson plan for the next month. Once the general topic for the evening is worked out, she will ask herself, "How can I make this into a game?"

I'll hear her say, "Nope, this idea is too similar to one we already did last year," or, "That's a good topic, but how can we make it fun?"

Caitlin suggested that Michele try to develop lessons plans for three years. That allows for plenty of variety without repetition. It also stretches the imagination to come up with more and more exciting topics for this wide-eyed younger generation.

We all have different learning styles. You or I may learn best visually, orally, or kinesthetically, through repetition, reading, mimicking, or role play. It's the same with the kids, so one style doesn't fit all. Michele is driven to learn and share what she knows thanks to the enthusiastic appreciation that she receives from the kids, their parents, her volunteers, and all the club members. Not a bad way to spend your retirement.

Watch Michele's Youtube interview by searching *Kids and Beekeeping!* Michele. **BC**

David Donnelly is working on his Journey-level certification through the Oregon Master Beekeeper Program.

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Dr. Jerry Bromenshenk

Communications From Bees

Montana is a large, very beautiful state where Dr. Jerry Bromenshenk has made his home throughout his life. He grew up on a farm in Billings. The crops grown were alfalfa hay, barley and corn. Jerry's father contracted to feed cattle, as many as 1,100 during a year, brought in from the range before they went to market. Since Jerry's father did not own the cattle, he changed to dairy cows, which his own father raised and milked. The farm had the usual assortment of animals, pigs and dogs and cats, and chickens. But the rooster that attacked and terrified Jerry, age five, ended up on the dinner table. His wild mice enjoyed the running wheel he provided for them. He also liked investigating swimming organisms in pond water with his microscope. His love for building things resulted in a large, three-foot by three-foot ant farm. His hobby now is still building things, only today it is fine furniture. He enjoys time in his woodworking shop

with most of his father's woodworking tools, but he also keeps adding to the collection.

During his childhood, farm work was necessary, so he became the tractor driver during the Summer months, starting when he was five years old. His school teacher didn't believe his story about spending the Summer driving the tractor, so his parents had to verify his story. Jerry also began helping his father with milking the dairy cows when he was about eight years old. When his father retired from farming because "it wasn't fun anymore" Jerry realized that he never thought farming was fun even though he liked the animals. He did not consider staying with farming because he had too many allergies.

After two years at what is now Montana State College – Billings, he transferred to Montana State University in Bozeman, majoring in Zoology with minors in chemistry and philosophy. He continued on there to receive his PhD in Entomology, minors in biochemistry and philosophy. His roommates at college were in electrical engineering and mechanical technology. To earn some money, Jerry and his two roommates built high-end stereo systems for the faculty members. This project gave him the foundation of his future work with recording bee behavior and bee sounds.

Jerry's PhD thesis topic was on the Big-Headed Grasshopper with blue "knees" that had specific feeding preferences: western wheatgrass in certain areas, but it also grazed on stressed vegetation. His work was one of the first to show that insects

could change their behavior. The grasshopper's feeding preference was partly from both visual and sound communications. He made an endless number of audio tapes of their sounds for frequency analysis. He found that the grasshoppers had a large "vocabulary" of sounds: ones for territory, another for attracting mates, another for chasing off competitors and even one for controlling distribution of population. So here was his start in insect sounds that has continued for many years with studying the sounds of bees.

Jerry likes bees for several reasons. He learns something new from and about them all the time. He appreciates an animal that can defend itself, one that is not domesticated. In his words: "one has to meet them on their own terms."

He received his PhD in the early 1970s when the world's petroleum crisis caused the opening of open-pit coal mines and coal-fired power plants in eastern Montana, North Dakota and Wyoming. Jerry was recruited to join a research team investigating the effects of the coal-fired power plants on forests, rangeland and crops in eastern Montana. His work, to look at pest insects on trees and rangelands, soon switched over to the 6000 colonies of bees near four coal-fired power plants. Although many U.S. Government agencies were funding the various projects, Jerry's funds came primarily from the Environmental Protection Agency (EPA).

Since the information from eastern Montana showed very clearly the area of power plant emissions, Jerry and his team were sent to Puget Sound to monitor pollution in that area. He termed his bees "flying



Jerry
Bromenshenk

dust mops” since the bee’s body hairs accumulated airborne particles. The results snowballed into working at other sites and ended up with the interest of the Department of Defense that sent him and his team to various U.S. Army sites in Maryland.

Could bees detect land mines and also signal toxic chemicals? They certainly can! Those working on the toxic chemicals tests reported the bees’ sound changes immediately when exposed. The bees at work finding unexposed land mines were so successful that they found one that nobody knew was buried. The hives used for this sort of work are actual working hives with one big difference – they are also full of electronic equipment detecting many things about the bees’ actions, sounds and responses.

For 20 years Jerry was the Montana State Director of a Department of Energy program to obtain competitive grants for energy research. Because of his skills at grant-writing as well as building teams, the University hired him to lead the state’s Energy Program. This program involved the three research institutions of Montana – the University, Montana State University and Montana Tech.

During Jerry’s work with bees over the years he has observed not only their sounds but also their behavior and their ability to learn, rather quickly, about their surroundings. One project involved bee hives living on a boat where the bees could travel out to search ocean-going boats as well as searching shorelines. The colonies chosen to ride on the pontoon boats were trained to detect explosives. For the first day or two the bees refused to leave their hives. Then the bees must have decided the rocking boat was now normal living conditions and started their usual flying out to forage. They were able to search other boats as well as the shoreline.

When the project ended after two weeks, the hives on the boats were collected along with a number of hives that had been stationed on land for some surveys. That night, hot and muggy, the colonies that had been stationed on land objected strongly and nastily to being loaded on the truck. The bees from the pontoon boats, used to erratic motion, did not even bother to stick their heads out.

In another experiment bees were

Instructors.



fed syrup and were marked on a high table next to the door of a pickup truck parked in a grassy field. They would then fly back to their hives in an apiary two miles away. The bees were supposed to search the grassy field for odors from flowers. However when the pickup entered the field, the bees would meet the driver at the truck’s door and follow him wherever he went. If the driver was not there but other people were, the bees would hover in front of them waiting for the syrup, causing a bit of a panic.

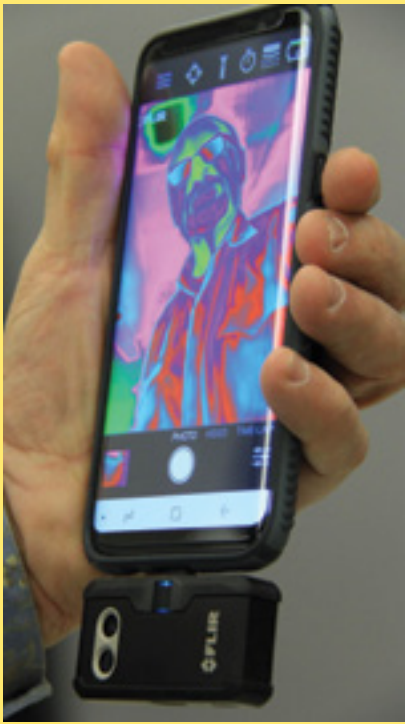
Throughout Jerry’s years of working with bee sounds and behaviors, technology has progressed rapidly, enabling him to take advantage of the newest systems as they came along. He does not, and has not, worked independently. He assembles teams of people, experts in different fields, some of whom have worked with him over decades. In 2003 Jerry, with four other University of Montana faculty, founded Bee Alert Technology. One colleague, Robert Seccomb, is an expert in computer Artificial Intelligence (AI) that makes the newly-introduced app the most convenient way for your colony of bees to inform the beekeeper of its status.

Over the years Jerry thought of ways a beekeeper could learn the health of a colony from the sounds produced. Not too long ago in 2012 he and his team had developed a hand-held recorder that did record and analyze some sounds. However the technology current at that time meant it was too big and cumbersome to produce and too expensive. Furthermore, it had a tendency to break, especially when run over by trucks. So that particular approach was abandoned.

Jerry did not have long to wait for new technology. In 2017 Android’s and Apple’s new smartphones appeared with fast processors. What had taken minutes to process now took only seconds. So this past Spring the Bee Health Guru app was introduced. You may have seen the article in the May 2019 issue of *Bee Culture* with its description and requests for feedback from users. With Jerry’s smartphone app, beekeepers worldwide can contribute to bee sounds and behaviors, thus increasing our knowledge of a remarkable small insect, the honey bee. You can also listen to him talk about this and his program on www.BeekeepingTodayPodcast.com.

His work over the years, has taken him throughout the U.S. and Canada as well as Europe, South America, Malaysia (where he saw the giant honey bee), New Zealand and Australia. The honey bees of New Zealand have a different sound than the bees found in the U.S. Through his work with bees over the years he has found some very interesting aspects of bee behavior that will keep him continuing research.

He feels that today we do need healthier bees and that our bees need better management, both by small-scale beekeepers and the large commercial outfits. Jerry has watched technology change faster and faster throughout his life and this progress has changed agriculture. His comment, “honey bees will survive, regardless of what we do” indicates that it is the beekeepers who may not survive the losses that are occurring today. One thing is certain: things are going to keep changing. Beekeepers who don’t, can’t or won’t change will be left behind.



His wife, an educator and artist, enjoys keeping track of Jerry's work with bees by keeping a scoreboard. Whenever the bees do something unexpected, the bees win one point, while he receives a zero. So far, the bees are winning. He, and his team of collaborators, do attempt projects where the risk of failure is high. But that approach can have high pay-off.

Jerry is not a beekeeper. However he and his team have colonies that are used for classes and their research. They usually have about 25 or up to 50 colonies. If more are needed they will rent them.

Although Jerry officially retired from the university in 2012, he was soon back there to work as the lead instructor of the university's Online Master Beekeeping Course that now reaches not only throughout the United States and Canada but also 15 other countries around the world. Jerry, with two associates, teaches 43 weeks a year for this course. He and his team will be accumulating input from the Bee Health guru app to make assessments and improvements – and, of course, trying to find answers to the newly-discovered information found. Now, in his retirement, he tries to stay at home in Missoula to enjoy the mountains of western Montana. But bees and their sounds, their language, their behavior and beekeepers worldwide will still be a part of his life. **BC**



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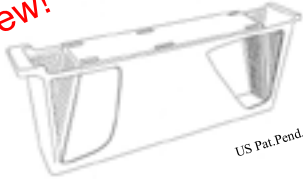
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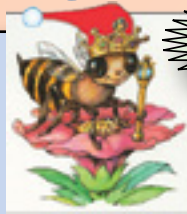
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Beehive Fences

What happens when you get people, elephants, and bees together? You get creative ideas to solve a real world problem. The problem? Farmers in Africa needed to find a way to keep elephants from eating and destroying their crops. The solution? Scientists discovered that using bees frightens away the elephants before damage is done to the crops or the elephants. The story? A book written about this project. Meet three very special people: Dr. Lucy King, Mario Padillo, and Pat Kittelson.

Mario Padillo



The Butterfly Pavilion
www.butterflies.org

Lucy King during a beehive fence construction in Lewa, Kenya
© 2019 Naiya Raja



Mario Padillo

Mario Padillo, an entomologist from the Butterfly Pavilion in Westminster, Colorado, teaches beekeeping in Tanzania and helps to build beehive fences based on Dr. Lucy King's work.

Tell us a little about your work.

I work as an entomologist at the Butterfly Pavilion. One of our projects is helping farmers in Africa keep elephants from eating their crops by using honey bees.

Tell us about your beehive project in Tanzania.

In June of 2019 Butterfly Pavilion traveled to Lamadi, Tanzania to teach 60 farmers how to keep bees, harvest honey, and build beehive fences. This project is possible with help from the Katie Adamson Conservation Fund, Peace for Conservation and the Butterfly Pavilion.

What is a beehive fence?

A beehive fence is a row of beehives hanging on wires that surround a garden or farm.

How does it work?

When elephants try to eat the crops, they run into the wires and shake the beehives. The guard bees fly out of the hive and sting the elephants, causing the elephants to run away.

What is one thing you would like to tell our readers?

Invertebrates, like honey bees, worms, and spiders are amazing animals and they are necessary to our environment. They help pollinate our food, recycle nutrients in the soil, and are a food source for countless other animals. Please help conserve these animals by recycling trash, planting native flowers, and not using sprays to kill bugs in your garden.

Dr. Lucy King

Dr. Lucy King of Nairobi, Kenya developed a way to protect farms from hungry elephants and to reduce human and elephant conflict. How you may ask? Making a beehive fence around a field frightens the elephants away when the bees become disturbed. Pretty cool huh? <http://elephantsandbees.com/>

Jars of Elephant-Friendly Honey in Sagalla, Kenya
© 2015 Tess Morrison



... Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com and www.bee-culture.com

December 2019

Pat Kittelson

Pat Kittelson tells the story of Dr. Lucy King's work with beehive fences in a book called, "Bixley Baines and the Beehive Fence".



Tell us more about yourself.

I keep busy in Denver, Colorado writing, reading, keeping bees, gardening and knitting. I have lived in many interesting places - Western Samoa, New Zealand, Minnesota, Utah, Arizona and Colorado. I studied to be a librarian because children's books are clever and important.

How did you get interested in writing a book about the beehive fence?

I keep bees as a hobby and am interested in bee research. I am also interested in people working to solve problems with clever ideas. When I read about Dr. Lucy King's work I was smitten and thought that it would make a great story.

What do you find intriguing about honey bees?

It's difficult to pick one thing as honey bees are always teaching me something new, but if I had to pick one thing that intrigues me, it is how honey bees work together for the good of the hive rather than for themselves.

What is one thing you would like to tell our readers?

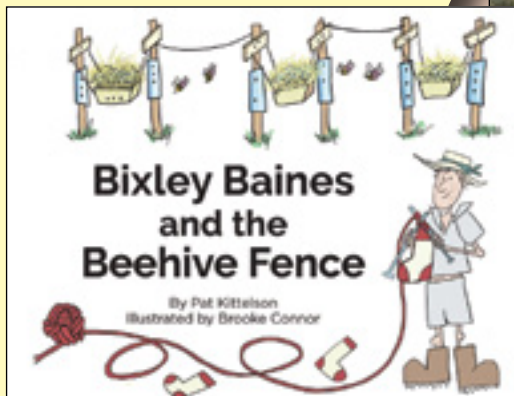
There are so many ways to use creative ideas to take care of the earth and its creatures. So be clever and creative!



A full beehive fence in Sagalla, Kenya © 2017 E&B



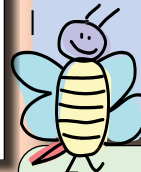
A full beehive fence in Sagalla, Kenya © 2017 E&B



Become a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 117, Smithville, TX 78957.

Name
Address
Age
Birthday Month
E-mail (optional)



We will send you a membership card, a prize and a birthday surprise!

Send all questions, photos and artwork to: beebuddiesclub@gmail.com or mail to the above address.

Find out more about Pat's books at www.bixleybooks.com.



Ross Conrad

Leif Richardson is a researcher who studies the ecology, distribution, and declines of native bees, especially bumble bees. He is an ecologist at Stone Environmental, where his consulting projects include pesticide risk assessment for bee pollinators, inventory of wild bee populations, and endangered species work. He recently completed a USDA National Institute of Food and Agriculture (NIFA) postdoctoral fellowship at the University of Vermont (UVM) in the lab of Dr. Taylor Ricketts. His research examines multiple mutualisms (symbiotic relationships beneficial to all organisms involved) that flow between a pollinator-dependent crop plant, highbush blueberry, its bee pollinators, and its mycorrhizal fungal associates.

Richardson initially became

Leif Richardson

Native bee research in Vermont.

interested in bees while studying the ecology of plant reproduction at Earlham College in Richmond, IN. He became fascinated by the interaction between bees and flowers, and this fascination has stayed with him and helped to motivate his work in this basic area of interest ever since.

Nectar robbing

After a year of work as a field assistant to other biologists and as a farm hand, Richardson completed a Masters degree at the University of Arizona, where he studied nectar robbing. This is the phenomenon in which bees cut holes in flowers in order to access nectar without entering through the flower's natural opening. Bees often choose to rob nectar when their proboscis (elongated sucking mouth part that is tubular in shape and flexible) is too short to reach the nectar in the conventional way. There are a limited number of bee species that regularly gain access to flowers in this way, and are called 'primary' nectar robbers. Primary nectar robbers leave holes in flowers, allowing a diverse array of so-called 'secondary' nectar robbers, the insects who will utilize these holes for

their own use. For example, blueberry growers often observe that carpenter bees slit flowers in this way in their orchards.

Honey bees are not known to make the holes themselves, but in the presence of carpenter bee nectar robbing, they readily switch from 'legitimate' nectar collection (i.e., entering flowers through their natural opening) to operating as secondary nectar robbers. When bees bypass the floral opening and bypass the flowers pistil (pollen receptive female reproductive part) and stamen (the male reproductive part that contains the anthers that produce pollen), plant reproduction and crop yields can be reduced. Although it is easy to think of primary nectar robbers as plant antagonists, interestingly, the damage they do to flowers does not always result in lower reproductive success and the consequences of nectar robbing can be negative, neutral, or positive depending on the plant and robbers involved.

Self-medicating bees

Richardson worked as an ecologist for the Vermont Fish and Wildlife Department for nearly 10 years before returning to bee studies, this time completing a doctoral degree at Dartmouth College in Hanover, NH. In this work, Richardson showed that naturally occurring nectar and pollen chemicals can impact the foraging behavior and health of bee consumers. He found that a variety of these compounds – including alkaloids like nicotine and the terpenoid thymol – can reduce disease loads in parasitized bees, potentially protecting them from the negative impacts of parasitism. At the same time, these toxic compounds can have negative effects on bees, meaning they should avoid consuming them unless they are parasitized. In addition, he showed that bumble bees make foraging decisions based on their health status, seeking out such nectar chemicals when diseased. According to Richardson, "Bumble bees will



Leif Richardson displaying a captive bumble in the field.

taste nectar in flowers and search out the nectar sources that contain the chemicals that match the needs of the hive.” This self-medicating behavior has only been observed in a few other insects, including honey bees, who increase their collection of propolis when the hive is challenged by pathogen infection. Secondary metabolite chemicals like these are ubiquitous in floral nectar and pollen, suggesting that plant chemistry could have far-reaching consequences for bee consumers and plant reproduction.

Underground fungi’s importance for pollination

Blueberries and other plants in the heather family (including rhododendron and cranberry) form mutualistic root associations with specialized mycorrhizal fungi. The fungi colonize the root system of the plant, providing increased water and nutrient absorption capabilities within the acidic soil environments they often occupy, while the plant provides the fungus with carbohydrates formed from photosynthesis. These fungi are usually ignored by farmers, but it appears that these plant mutualists have the potential to increase yields if managed properly. At UVM, Richardson inoculated blueberry roots with mycorrhizal fungi, and then measured aboveground traits as the plants grew. He found that mycorrhizal blueberry plants have larger flowers than uninoculated plants. The flowers also produce more nectar with altered phenolic chemistry, and Richardson found that bees were more attracted to flowers of mycorrhizal plants, resulting in increased pollination and fruit set. Other work in the Ricketts lab has shown that highbush blueberry farm yields in Vermont tend to be limited by a dearth of wild bee pollination, an ecosystem service itself limited by pesticide use and habitat quality. Richardson’s work shows that in addition to managing better for wild native bees, growers can reduce this pollination deficit by inoculating plants with their mycorrhizal mutualists. The study further demonstrated that blueberry cultivars respond differently to the fungi and that inoculated plants are more resistant to herbivore damage.

Research surprises and challenges

Richardson was surprised by fellow UVM colleague Samantha Alger’s recent work that shows that honey bee viruses are being transmitted to bumble bees through the shared use of flowers. Richardson notes that, “this study has very large implications for bee health, given that honey bee viruses are ubiquitous in hives throughout North America. When we start thinking about an agricultural animal (honey bees) being placed all over the landscape and spreading diseases to the wild animals they are related to, it’s a pervasive environmental problem. Virus management is difficult, yet beekeeping is an important part of agriculture.”

At Stone Environmental, Richardson is conducting some of the most challenging bee research he has been involved in. Says Richardson, “I am doing a pesticide risk assessment with Bumble bees where we are exposing bees to pesticide residues on flowers inside of green houses. In order to do the study in a fully replicated, rigorous way, we had to plant seven acres of flowering cover crop, then build 18 greenhouses over it. It has been a real challenge to put up so much infrastructure and then collect foraging and mortality data from so many bumble bee colonies all at one time, combined with all the rigors of field work. It has gone really well, and yielding some valuable and exciting data that I hope to share soon, but it has been really challenging.”

Richardson continues, “When EPA is considering registering a pesticide they require that the manufacturer demonstrate that it is safe for pollinators that may be exposed to it. Risk assessment scientists use the honey bee as a surrogate animal for other bees, but the honey bee is not a realistic surrogate for many of the 4,000 bee species native to the United States.” Richardson continues, “To address this, EPA and their counterparts in Europe are developing risk assessment methods using other bees, including bumble bees and mason bees. These methods have been established in the EU with a bumble bee native to the Old World, but in North America we have not yet done this work. Stone Environmental’s

study with a North American bumble bee species is contributing to this knowledge gap.” In the future, the methods that this study has shown to be effective can be used to test the safety of new pesticide products under consideration for registration by the EPA.

What does the future look like for bees? Richardson is concerned about the many challenges facing beekeepers and the pollination industry, but he cautions that we could face a much larger pollination crisis. “I do a bunch of work looking at bumble bee pollination declines and it is kind of stunning how strongly some of the wild bee populations have declined during the time I have spent looking at them over the last 20 years. My perspective is we are in for rough sailing. We are going to lose more of North America’s native bees in the future. I think we are going to have to face something of a reckoning on what this will mean for agriculture and the way we grow food. I think we are going to have to have a very hard conversation as a society about pesticides, about climate change, about honey bees and beekeeping, and I am not very optimistic about the future with respect to the health of our pollinator populations.” That said, Richardson still feels that there is still reason for hope. “It has been wonderful to me that so many people are trying to address this problem by restoring habitat and by reporting occurrences of wild bees to help us try to understand their population distributions. Beekeepers are thinking more about the bees and what goes on within the hive. It is encouraging to me that so many people want to do something about the problem.” **BC**

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Meet Sarah Red-Laird

Malcolm Sanford

There's a quiet revolution going on in the beekeeping community. Over the last decade or so beekeeping regulatory, extension and research has transformed from a cadre of almost all human males to a current population, which is significantly female. This "feminisation" is continuing and it will be intriguing to see how present programs in beekeeping might transform in the future due to this shift. To see this in action, one only need glance at the makeup of several professional associations in the beekeeping field. It is perhaps most clearly apparent in the regulatory area by looking at the current membership list of the Apiary Inspectors of America.

Sarah Red-Laird is one of these growing number of females who are becoming more prominent in all aspects of the beekeeping trade. The "Bee Girl" was born in Ashland, Oregon and raised there, as well as in Southeast Alaska. With a teacher as a mother and father as hunting and fishing guide, Sarah looks to have had a perfect environment to grow up in, culminating in an interest in leadership, resource management, and wilderness study. She majored in these fields as part of her academic training, which focused on outdoor recreation leadership at Central Oregon Community College and community collaboration and environmental policy at the University of Montana's College of Forestry and Conservation.

She's one of the Oregon Trail Generation, named after a popular game at the time she was growing up. Born between 1977 and 1985, her micro-generation is sometimes labeled "Xennials." This is a group that generally was raised in a house with a computer and Internet access.

Sarah's first experienced beekeeping at the age of four while watching beekeepers work their bees and harvest honey in an off-the-grid community her aunt lived in in Southern Oregon. She loved watching the bees, and was transfixed by the honey harvest. She carried an affinity for all-things-bees with her all the way to college in Montana. For her honors college thesis topic, she chose

bees and Colony Collapse Disorder. This was 2008/09, peak CCD years.

Sarah's first sting (as an adult) was up the nose while working bees as a student volunteer. Her face painfully morphed from Cindy Lou Who (The Grinch Who Stole Christmas) to mid-90s era Julia Roberts (those famous lips), and finally back to normal in about a week. Nevertheless, she showed up at the lab with the ability to smile through the pain and laugh at herself.

This was when bee lab employee Scott Denham taught her one of the most important lessons in beekeeping, "If you get stung, it's because of something you did. You are never to blame the bee. Think back as to what you can do different next time." Her second sting was in the hand, the day before graduation, leading to one of the most embarrassing moments of her college career, offering the Dean of the College of Forestry and Conservation, Jim Birchfield, her comically-swollen club of a hand to shake during the diploma hand-off.

On graduation day, Debnam informed Dr. Jerry Bromenshenk that "he would be remiss if he did not offer Sarah a full-time seasonal position in the bee lab," and her career in beekeeping officially began. Professor Bromenshenk is a bee researcher at the University of Montana, known for original research with honey bees in the fields of pollution monitoring and employing the insects to find plastic land mines, his infamous



insect “bomb sniffing bee” project. In retirement, he is leading an effort using smartphones to examine the role of sound in honey bee health, known as honeybeehealth.guru. (Read more about this in Jerry’s interview by Ann Harman, in this issue.)

Honey bee research wasn’t exactly Sarah’s vision of a career path. Hoping to gain employment at a water-conservation nonprofit, aligned with her past work experience and college degree, she accepted the position in the bee lab only as a stop-gap measure until an opening with Trout Unlimited or the Montana Water Trust would become available. The Great Recession intervened, however, and Sarah would never return to the water world after becoming embedded in the beekeeping community. Looking back, she feels she was destined for a life with bees, looking at the honey bee hive as, “always making sense when almost nothing else did.” during her decade-long career in the bee lab at the University of Montana.

Scott Debnam received his undergraduate degree in Wildlife Biology at the University of Montana, and is unique in that he is a student, staff member, as well as an instructor. Beginning in honey bee research when he first became a student, he also never planned to make a career out of it. Researching bees for well over a decade at the University, however, has transformed him into what he currently is today, head bee field researcher at the University of Montana. Significantly, he is now a member of the Bee Girl Organization’s Board of Directors.

Striking out on her own after leaving Montana, Sarah picked up two experienced commercial beekeepers as mentors:

Zac Browning is a 4th generation commercial beekeeper and honey producer. He is a co-owner of Browning Honey Co. Inc. With his brothers, he operates over 20,000 hives for honey production and pollination in ID, ND, and CA. He has served the beekeeping industry as Chairman of The Honey Voluntary Quality Assurance Committee, as Trustee for the Foundation for the Preservation of Honey Bees, and as a current board member of the National Honey Board, True Source Honey, Project Apis M. (PAM), and the National Pollinator Defense Fund.

Sarah and Zac teamed up to develop a program (webinar) for up-and-coming beekeepers, called the “Next Generation Beekeeper,” to discuss issues, solutions, and consequences of inaction they saw in the beekeeping industry. In the preamble they state: “We are the next generation in our family of beekeepers, we are the drivers of the next stage of development in the products, services, expertise, and knowledge our industry provides. Whether a beekeeper is a commercial or small scale operator, or works as an educator or researcher, they are passionate about bees, and want to be involved in future beekeeping innovation, research, policy, technology, advocacy, or community leadership. In the near future, we need a functional model of collaboration and diversification. You tell us what that needs to be done, we’ll listen and help to develop a positive action plan.”

John Miller is a great grandson of one of the pioneer migratory beekeepers in the U.S., Nephi Ephraim Miller, who started in 1894 with seven boxes of bees (the better end of a swap), figured out that he could winter his Utah bees in California, and ended up with the nation’s first million-pound crop of honey. John continues in his footsteps as one of the premier almond pollinators that has truly developed commercial pollination into something that is the current basis for modern beekeeping as a career.

Finally, Sarah has been influenced by perhaps the best-known current female pioneering researcher, Dr. Marla Spivak at the University of Minnesota. She’s the only honey bee investigator to win the MacArthur “Genius” Award, and is current Fellow and McKnight Distinguished Professor in Entomology at the University of Minnesota. Other awards include the 2015 Minnesota AgriGrowth Distinguished Service Award, the 2016 Siehl Prize laureate for excellence in agriculture, and the 2016 Wings World Quest Women of Discovery Earth Award.

In summary, here’s what Sarah says she received from the above bevy of mentors:

§From Scott Denham I learned to love bees like I was married to them.

§From Prof. Bromenshenk I learned the scientific method.

§From Zac Browning I learned how

to be a great beekeeper by getting my hands in hundreds of his hives, alongside him and his crew. I also learned that in order to make change you have to show up and speak from the heart.

§From John Miller I learned to see things as they really are, and then laugh about it.

§From Marla Spivak I learned to always show up in integrity and never let myself be affected by how others judge me.

Returning to Ashland, after her seasonal position at the UM bee lab had ended, Sarah found herself out of a job during the worst of the recession (2010-2011). This “curse of the Xennials” meant only one thing, creating her own path to a meaningful career. Thus, she “organically” ended up developing something she calls “Bee Girl.” Employing her generation’s familiarity with the Internet and social media, Bee Girl has become a growing enterprise, complete with its own website that features employment opportunities, a cadre of volunteers and a Board of Directors made up of specialists, all focusing on the Bee Girl philosophy.

Finding staff to support the Bee Girl enterprise has been Sarah’s biggest challenge. As a consequence, she and the Board decided to move the organizational model away from programs that require a large amount of staff hours, toward more collaborations and partnerships with organizations headed up by people whose passions and drive match their own.

Though coming from a family of educators, Sarah’s true love has always been conservation, as her formal education attests. While analyzing some bee pollen collected from the Midwest for a study in Dr. Bromenshenk’s lab, she concluded that there was a serious bee habitat issue. It took a decade, she says, to finally work herself into a place to be able to focus on primarily on habitat research and conservation.

Partly in preparation, Sarah, as President, chose the venue for the recent 2019 Western Apicultural Society conference specifically based on the hotel’s openness to work with local farmers and ranchers. She was meticulous about menus and worked for weeks to ensure that WAS beekeepers would be supporting local, sustainable, bee friendly operations

with their conference registration dollars.

Her blog post on the event is worth a read: “Our conference theme was ‘Hive Mind for the Greater Good.’ My vision was for people to come together in an inclusive space to meet, listen, share, laugh, and be inspired to go home and carry on their good work for bees, with a fresh view as to what that could look like. The comments that have been rolling in from our post-conference survey, and on social media, have shown that we were able to do just that!

“This conference was no small feat. I’ve attended (as a speaker or attendee) almost 70 beekeeping and farming conferences over the last decade. I started dreaming of hosting my own about five years ago, and stepped into the role to do just that two years ago. I’ve been muddling over every detail, and asking for direction from beekeepers, for quite some time. I’ve been considering everything from where the food would be produced, to where the tee-shirts would be made (and how the cotton in the tee-shirts is farmed); to how to create the most diverse schedule to include a variety of interests (beekeeping, native bees, research, art, health, policy and pesticide issues, the business of bees, etc.); to the length of time given between keynotes and workshops for networking and processing; to also how to create an experience for conference-goers where they get to take the microphone, and tell their stories, too!”

In keeping with the beginning theme of this interview, a post on social media sums up what appears to have been overshadowed at the WAS event, but is no less significant, “Today as I fly home from the Western Apiculture Society Conference I’ve been processing just how special this

gathering was. Not only was it my first beekeeping conference to attend but also my first invitation to speak and teach at one. However, that isn’t even what was so unique. What was really special is that every single expert on stage was a female. We had women scientists and researchers, entrepreneurs, community leaders and activists all gathering around our shared love and passion for raising healthy bees.”

Sarah now is now turning her attention to larger issues, believing that “beekeepers are in very good hands.” She has taken on the role as President of the Northwest Farmers Union, an entity of the National Farmers Union (NFU). “. . . to help breathe life back into the organization.”

She’s looking forward to meeting the new NFU board, and staff from Washington DC, who will be coming out to Southern Oregon this Fall for a strategic planning session. After that she says, “We’ll officially announce our goals. I can tell you that it will be along the lines of forming collaborations with strategic partners to support farmers and ranchers in the northwest to conserve soil, increase diversity, forge solutions to climate change, halt overproduction by using supply chain management, and build community health.”

This appears to fit in nicely with other projects listed on the Bee Girl website. Each has a unique set of collaborators:

The Oregon Department of Transportation (ODOT) project manages 196 acres of vernal pool habitat for the purposes of wetland and listed species mitigation in Central Point, Oregon. Vernal pools are a locally significant wetland type that supports unique plants and macro-invertebrate communities,

including three state and federal protected species: vernal pool fairy shrimp (*Branchinecta lynchi*), Cook’s desert parsley (*Lomatium cookii*) and large-flowered woolly meadowfoam (*Limnanthes pumila* spp. *grandiflora*). Starting in 2016 ODOT partnered with the Bee Girl organization to monitor pollinators at the restoration site as an indicator for restoration success. The other partners in the project are The Nature Conservancy and Oregon Institute of Technology.

The Regenerative Bee Pasture project came out of discussion with the Northwest Farmers Union Conference in an effort to find the best possible “win-win-win” solutions for farmers and ranchers, bees and beekeepers. It employs regenerative agriculture, understanding that rebuilding soil is the first step to healthy bees, livestock, and people. The Bee Girl Organization is managing and testing two pasture test plots, with the guidance of collaborators at Eastern Washington University, Washington State University, Oregon State University (honey bee lab, and local extension), and the Jackson Soil and Water Conservation District.

Other projects on the table include developing seeds for pollinators and designing bee-friendly vineyards. Two educational efforts are in full swing, Kids and Bees, a collaboration with the American Beekeeping Federation, and The Bee Girl Center for Education and Research; a physical hub at the Sampson Creek Preserve where she will have a permanent classroom, apiaries, a honey house, and research pasture.

Where will she go from here? Stay tuned. Some things are certain. She’ll be part of the potential revolution of farmers and beekeepers working together to increase bee pasture, as well as continuing the now-apparent gender shift in beekeeping’s regulatory, research and educational endeavors. **BC**



Honestly, I don't exactly remember

Honestly, I don't precisely remember my very first introduction to Editor Kim. It was a long time ago. I don't even remember when I exactly learned that he was to be the new editor of *Gleanings in Bee Culture*. Surely, I must have had anxious moments. Indeed, I even have them now in anticipation of Editor-to-be Jerry Hayes becoming the next editor.

As Kim began to take responsibility, I wondered if I would I still be able to submit frequent articles and interact with Kim in a productive manner? I previously had good working relationships with some of the previous editors that came and went during my professional life in Ohio. The editors with whom I have worked were Larry Goltz, Mark Brunner and, during a rare editor vacancy, John Root. But by far, most of my experience has been with Editor Kim Flottum.

In my early career, each of these editorial changes was a bit threatening to me. It was change. Honestly, I needed these editors to accept my submissions so I could aggrandize myself and develop a presence in the literature of the bee industry. In retrospect, I was not sure that any bee magazine needed me at all, but I needed them.

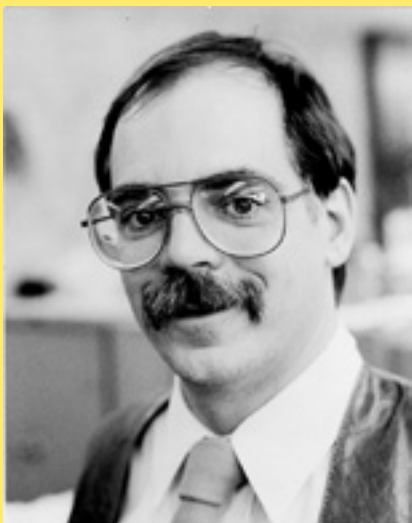
That was then

At this point, for those who can, please remember all that has come to pass in beekeeping. Oh, so many changes. For those who didn't get the chance to experience some of these past memories, I will try to describe just a few.

Those days were the very early days of personal computers. I could use Ohio State's computer room equipped with Radio Shack computers running a primitive word processing program called *Scriptsit*. It was a miserable clumsy software package to learn. Nothing was plug-and-play then. Printers were marvels that required setting individual dip switches to have the computer communicate with a specific computer model. It was a wild time in developmental computer technology. All of us old people slogged through these "Model T" years to get to where we are today. I have no interest in the good, old computer days, and want IT people nearby. It was a changing time for publishing a magazine.

Or, I could just ignore all of these early technical hurdles and do what I had always done for the other editors – hand write my article and mail it to the early editors with photos. I did that a lot. I have always been perpetually late when meeting article submission deadlines. In fact, this very article is remarkably late.

If I really cut things close, I would drive to Medina and personally deliver my hand written draft article on lined yellow tablet paper to Kim. On weekends or after hours, I found that I could pull the glass up ever so slightly on his jalousie windowed door and drop the draft



Editor Kim as he would have looked when we first met.

Kim Flottum, *Bee Culture* Editor

30+ Years Of Working With

James E. Tew

to the floor inside. This was frequently my delivery method. The building and the door are now long gone, but my memory is strong to Kim, Kathy Summers¹, and me.

I wish I had a single one of those hand written articles now, but they were a temporary transfer medium. None remain. Ahh, those were the good days. No, they weren't. They really weren't.

My first article

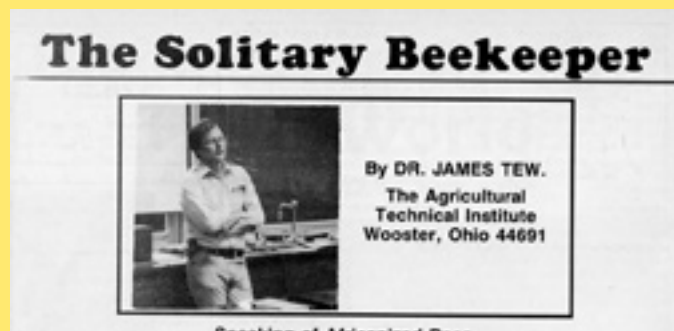
My first article for Kim's tenure as editor was the April 1986, issue. At the time, Africanized Honey Bees were all the rage. It's true. U.S. beekeepers were worried about them.

At the time, *Gleanings in Bee Culture* was using black and white and was printed on some kind of newsprint paper.

From my perspective as a writer, the advances that have been made during Kim and Kathy's time has been significant. It's true. Many of the other publications in the industry have also improved greatly, but *Bee Culture* is right there in improved publication advances. Additionally, Kim initiated a second bee magazine, directed primarily at true beginners, that has been well received. This



An example of jalousie windows. These are not Editor Kim's windows.



The article masthead of the first article I sent to Kim. April 1986.

¹Kathy S. is the Assistant Editor of *Bee Culture* and performs innumerable other tasks. She is critical to the operation of the *Bee Culture* operation. ↪



The masthead from January 1986, 33 years later.

subscription and newsstand publication is high quality and presents a good impression to whimsical buyers and to beekeepers who are establishing themselves.

Everyone with a video camera became a videographer

Just as today, everyone with a smart phone seems to be a moviemaker. It was more challenging in 1986 and for a while thereafter. Editing was particularly tricky. Piece of cake nowadays. After making a few very early videos with John Root, the CEO of the Root company, my video work sat dormant for a while. As I recall, it was Kim who first met Beekeeper Bob Smith. Having worked for Public Television, he was an accomplished video man and had decent video equipment. Bob was a highway to the next phase that Kim began with me tagging along. We had a crew. Seventeen years ago, we made videos. Some are more memorable than others.

We made multiple shows and Kim marketed them in *Bee Culture*. They were reasonably well received and commonly pirated as is still the norm. Not much changes. I have only a few of these old shows, but I do have one on queen introduction that Kim, Dave Heilman, and I “starred.”



An early video that Kim, Bob and I put together.

The video was action-packed. Bob had decent sound equipment and solid editing skills. It was a cliff-hanging bee movie. Since bee basics do not change much, the information is still valid, but the production is beyond format updating. Yes, it’s true. The piece is now “vintage.”

The stars of the show were:



And

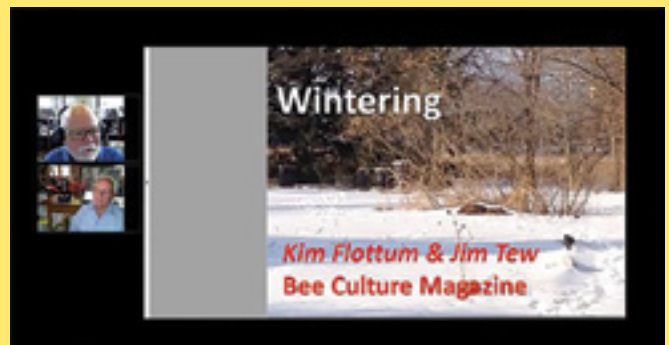


For your eternal enjoyment, I have posted this video at: <https://youtu.be/HklpteMF-aQ>



The Kim and Jim Show

Through years, other video projects came and went, but I suppose our highwater mark was the Kim and Jim Show. The K&J gig was essentially Kim’s idea. The concept was that we do various events as we could arrange them. Beautiful on paper, but sometimes terrifying in reality. It was to be live without any time delay. What we shot is what you saw (and heard). Kathy has always been the videographer. I sometimes feel that people watched just to see what we would do next, and how we would recover from it – all live – and all with an element of movie danger.



The first Kim and Jim Show.

Some of the events were PowerPoint presentations, while others evolved into interviews and outdoor events. We even have accomplished two international events from New Zealand and another from France – once again live. For me, this project has been a challenging event that forced both Kim and me to grow, ever so slowly, in Internet video technology. I've a bit of video experience, but I must say that I doubt I could ever have done this without Kim's IT people leading the way.

An example of a Jim and Kim show on the subject of package bees is shown at: https://youtu.be/Rsybj6K_5BE



Eastern Apicultural Society (EAS) events

In 1995, Kim, Kathy, and a host of others including me, hosted the 1995 Eastern Apicultural Society (EAS) event. From the start, we all wanted it to be a major happening with many speakers and multiple outdoor events and equipment demonstrations. We accomplished most of that. A rainy day forced some changes, but we were prepared for them.



Kim as president of EAS at Wooster, Ohio, 1995.

Kim went on to preside over several other EAS events, including being Chairman of the Board for eight years, and another EAS happening with President Kathy at Kent State University in 2005.

A promo video tape, of the 1995 meeting is presented at the following web address. It shows many old-time beekeeping masters in this twenty-four-year-old video. It is a quick video history for new beekeepers. Be warned that it is dated, from an old film format, and more than a bit hokey. At the time, it was good. Now, it is forgotten. Kim, however, provided a stellar performance.

EAS Year of the Hive, 1995 promo video https://youtu.be/61_-DyXP9Lo



You will break some eggs

While working with someone for more than 30 years, some eggs will get broken. By far, most events, trips, video shoots, or projects, nearly all were uneventful. But there were those that stand out. Here's one.

It was to be an uneventful drive.

Yes, it should have been an uneventful trip. We were to speak at an Ohio Farm Bureau meeting in Columbus. Our topics were something about bees. Early morning, Kim and I left Wooster, with me as the driver of a typical high mileage Ford Taurus state car. The sun was to our back, and I was driving the speed limit. Any traffic citations awarded while driving a university car belong to the driver and not Ohio State. I was a steady driver. Because it was early, our conversational chatter was painful or non-existent. The four-lane highway had at-grade crossings. The road was not an interstate.

At the moment, we were quiet. I was watching a car that had pulled into the center median at a crossroad and kept slowly rolling. I felt that the car was simply crowding me to get past the intersection so the occupant(s) could go their way. Obviously late for something, the car kept slowly rolling. I was driving about sixty miles per hour, and the vehicle in the median was still slightly rolling.

At the absolute last possible millisecond, the car accelerated – hard. I was right at the car. I had no chance. One of my strange memories was the mental still photo of a Chrysler® automobile emblem being right at my left mirror. My second mental still photo was the ditch before us. The impact was deafening. Tiny pieces of glass flying everywhere. White dust all over. Kim, more than I, had tiny blood flicks all over his arms and face. I only had a few.

Then there was the steam, the hissing, and the car alarm going off. Confusion. People all around. Kim getting out of the car. Having banged the left side of my head on the upper door jam, I was wondering who the president was and how we got into this ditch. Ultimately, we were okay. The other driver was at-fault. She contested at the site, but witnesses confirmed what happened.

The thing that surprised me most – during the lead up to the impact, then during the impact, and then the aftermath – Kim nor I uttered a single sound. I suppose I thought we would be producing exotic language, screaming, moaning – something. Throughout the event, we made not a single sound. I was trying to drive, and Kim said he was bracing for impact. I suppose we were both busy.

That was a high-water mark of a sort, and a trip we will not soon forget.

A few photo memories



Jim explaining to Kim that he will not be stung.



Jim working on the video set as Kim offers instructions.



Kim offering me instructions on facial hair growth.



Yet more instructions from Editor Kim.

No one is going away

Kim has said that he is not going away. Neither is Kathy. She will continue to work with new Editor Jerry for a while. I will continue to bore long-suffering beekeepers about how good the old bee days were. Kim, I suspect will continue to write books and produce podcasts. Maybe we will try some more videos. We are not retired. Just presently unemployed. **BC**

Dr. James E. Tew, Emeritus Faculty, Entomology, The Ohio State University and, One Tew Bee, LLC; tewbee2@gmail.com; <http://www.onetew.com>

<https://youtu.be/eKwIOSpFerM>



Kim and Jim with Denzil St. Clair at the 100th Anniversary celebration of the Lorain County Beekeepers in Ohio.

BIGGER PICTURE

Jessica Louque

The Un-Interview

As most of you may not know, I am always behind. Everything is always late, behind schedule, not on time – however you'd like to put it. Kim is usually pretty forgiving of my ridiculous sliding in at the last second (maybe way past the last second) on deadlines, so I thought I'd get a head start on the interview edition. I started working on this back in early August in hopes to have everything settled by the October deadline. My goal for this was pretty lofty considering I was aiming for corporate level interviews, but apparently it was a little too high on the sights.

On the side, I love skincare. I jumped on the Korean 10-step skincare routine as soon as I heard about it. I am not a big fan of makeup but I will wear a skincare mask all day long if I can. I also am hyper-aware of skin cancer as it's fairly common in a rural agriculture community due to the level of sun exposure from farm life.

Sunscreen is slathered everywhere anytime I go outside, any day of the year. Sometimes I can be a brand snob, but sometimes cheaper alternatives can be just as useful. In particular, I had two brands in mind that I thought would appeal to the *Bee Culture* reader community that would even care about skincare products in the first place. One was Farmacy, which is one of my go-to products for skincare. They have the absolute cutest honeycomb packaging and have a high-quality product line made from bee products. The second, my backup, was the new Earth-to-Skin line that Walmart produced. It is their own house brand with one part of the line focused exclusively on bee products. It's a lot more affordable than Farmacy and might have made some good Christmas present ideas for bee friends and family. I thought about trying for Burt's Bees, but they seem to be a lot less genuine after they sold out to Clorox. At

least you know what you're getting with Walmart instead of pretending to be a small-time hippie company just trying to make it on your own beeswax. Obviously in business, the goal is to make money, not to just get by, but marketing is everything nowadays and nobody likes to be duped.

I started contacting both companies in August, and Farmacy couldn't seem to reply to me for about two months – and only through messages I sent on Instagram, rather than the requests through the PR section of their website. Walmart responded straight away, but it seemed that they didn't quite know how to answer my questions. As beekeepers, I think most of us are



highly aware that ingredients are not always what they seem. I'd be curious to know the answers to my questions, but it didn't really seem like they thought anybody would ask or that they'd have to know the answers. Typically I start off this type of interview with "base" questions and then elaborate from there, depending on the answers given to the initial questions. Since NONE of these questions were answered, it seemed like a fun time to let you see what I meant to ask and what these lines either wouldn't answer about their products, or couldn't answer about their products. I'm sure there is a long line of people in the way of developing a product, but you'd think somebody would know. Maybe by next December, I'll have an answer from one or the other of these lines.

Some of these questions were just baseline questions that I thought were "gimme" questions so they could basically brag on their line and how

thoughtful they were saving the planet with bees, etc. It didn't seem like any of the questions were easily answered by even the marketers, and the skincare developers wouldn't respond to any of the questions. To me, it is important as a bee person to know what I'm giving or recommending to other people and where it comes from. I also like to know what I'm putting on my face. If you take the time to read these, think about what would be put into answering each question and how you would expect it to be answered. It's a little telling that they couldn't/wouldn't. In particular, the sourcing of ingredients. I'd personally rather support anything produced in America, pesticides or not, than organic that's imported.

For Walmart in particular, their other products in the line are plant based, which would make a difference on most people's faces and could probably skirt some questionable agricultural practices if they were grown in another country with less stringent regulations, but weren't being produced for direct consumption. I would imagine that Walmart in particular jumped on the bee bandwagon and just took their royal jelly and honey from wherever they could source it the cheapest and added ingredients to increase the scent. I would have been specifically curious about their Manuka claims though and how legitimate they are. My plan for the future is to continue attempted contacts with both of these companies to see if I can get a straight answer on any of my questions. If I actually can, then I'll publish the updated interview (likely with commentary). Until proven otherwise, I'll just assume that neither company is interested in interacting with their followers in a way that requires time or in-depth knowledge of their product. I truly thought these questions would be fairly simple for someone in charge

of media for a brand. The follow-up questions would have been the harder ones!

Interview Edition December 2019 for *Bee Culture* – Walmart’s Earth-to-Skin line of Honey Bee Products

Q: What prompted Walmart to start their own skincare line?

A:

Q: Does Walmart have a specific team dedicated to creating new products based on consumer demand? How do you go about all of the aspects of creating something that has to meet so many guidelines and regulations?

A:

Q: There are a few different focuses from the skincare, such as honey, the super greens, and the super fruits. What went into the decision-making process for which ingredients were used?

A:

Q: For our readers, the honey set would most likely attract the most interest. Can you tell us about the process you use to source your honey?

A:

Q: On your labels, you list specifically that you are using Manuka honey. As beekeepers, we know that there’s a lot of fraud associated with Manuka specifically, and that it can easily be masked as other honeys. In particular, it can be quite expensive when it is legitimate. What does Walmart do to ensure product quality?

A:

Q: For the Royal Jelly sheet masks, how do you decide where to go to purchase royal jelly and know that it is authentic? Do you have to outsource it due to the low quantities or are you able to purchase enough in the U.S.?

A:

Q: I am an unapologetic skin care junkie and immediately bought the cleanser, moisturizer, toner, eye cream, and of course the pack of sheet masks. I noticed that not only do they all smell like a hive, but honey is high up on the ingredients list. How do you decide what ingredients you want to include in your products?

A:

Q: A lot of companies seem to be going with the trends of natural ingredients. How do you feel like your Earth to Skin line compares to other brands touting a honey tagline, such as Burt’s Bees or Farmacy?

A:



Q: When you are developing a product line, how do you choose your price points? What section of your shoppers do you expect to cater to in this section?

A:

Q: The list of products for each focus is fairly large for the initial rollout. How long does it take to develop so many products and decide what gets to go first?

A:

Q: How long will you wait to determine success before you add new products? Do you have any products in mind to add to the line?

A:

Potential Follow-Up questions:

1. How do your contracts work with your beekeeper suppliers? Do you offer long-term contracts or do you go on a year-to-year basis? How

many suppliers do you rely on for meeting product demands?

2. When you decided on the specific products for the line, how long did it take you to source the beekeepers that you used? Who sources the beekeepers and what criteria is used to decide who supplies bee products for the skincare line? (If not direct, question 3)
3. What made you decide to use a middle man to purchase honey bee derived ingredients? Was it easier for the company to have someone else manage the ingredient portion? Why was someone in-house not in charge of this part? How do you ensure quality products through a middle man?
4. When competing with other similar skincare lines, does the quality of the ingredients or the price point get the most attention from a marketing perspective? I.E., do you charge more and say the ingredients are worth it, or do you say you use good ingredients but keep production low enough to underbid other brands?

5. How much of a role does packaging play into your marketing to draw attention to the honey bee aspect of the

ingredient list? How does the R&D team go about deciding on the best packaging in relation to cost?

6. What size team does it take to see this product through to the sales floor? What different positions are needed and how many new positions did it create within the company to see it off the ground? **BC**

Jessica Louque and her husband, Bobby run Louque Agricultural Enterprises, a contract research business specializing in apicultural studies. And they raise bees, and children, and chickens and more at their home in North Carolina.





Meet Carl & Virginia Webb

Jennifer Berry

The world of bees and beekeeping was introduced to me in the Spring of 1997 when I stumbled into a class at UGA taught by Dr. Keith Delaplane (my now boss of 20+ years). It was as if the clouds parted, the sun shone, the angels sang and the trumpets blew (Can I be more cliché!). It truly was a life changing event which led me down a path to some of the most exciting times of my life. The path also led to doors which were opened by some of the most fascinating, caring, lovable people I've ever met. Bees are super cool but beekeepers are in a class unto themselves. If you've been in this fascinating world more than a few years, and met a few beekeepers, you know exactly what I am talking about.

Back in the late 1990s, when I decided to jump into this strange new arena, our lab was involved in a research project which was to determine the economic threshold of *Varroa destructor* in the Southeast. Dr. Keith Delaplane, along with his colleague Dr. Mike Hood from Clemson University, had received a research grant which did not include funds for purchasing bee colonies; that's where Carl Webb stepped in. He and Keith met at a GBA meeting in the mid 1990s. At that time, Carl voiced an interest in being a part of research which was key in helping save honey bees from the destruction evoked by *Varroa destructor* (then *Varroa jacobsoni*). Keith was pleased to hear this not only because he enjoyed Carl's friendship but he also loved the beauty of Clarkesville and the North Georgia Mountains. This is where Carl's home and apiaries are located and Keith fondly named it, the North Georgia Bee Lab.

Over the next five years, Carl became a selfless contributor to honey bee research. He volunteered not only his time, but also countless colonies. Overall, he was involved in five research projects that included not only the UGA Honey Bee Lab but Clemson University and the University of Tennessee. Carl participated and allowed us to take numerous samples of bees and brood all in the name of science. His participation was very costly indeed and his contribution to these projects commendable.

I remember the first time we drove to Clarksville, and I met Carl. He was the epitome of a Southern gentleman; tall in stature, with a dry sense of humor and a gentle heart. I immediately liked him, not only because of his frankness but more so for his love and admiration of nature.

For the next several years, I became good friends with Carl and he became my bee mentor.

During graduate school and my early years managing the bee lab, I would travel to Clarksville, to help Carl while he assessed colonies, pulled and extracted honey, built

equipment and supered colonies for sourwood. I learned a great deal when I took that first course, but my real beekeeping instruction began with Carl. His patience and guidance helped me to better understand this wonderful world of bees.

Due to all the travel between apiaries, Carl and I had a good bit of windshield time, and during this time, I learned about his past and what drew him into the world of bees. Before bees would enter his life, though, there was war. When Carl was 18, he joined the Army and was shipped out to the 3rd Army in Europe. World War II was coming to an end so his service would include the Nuremberg trials, which to date is still considered "the greatest trial in history." These trials, held after World War II, were a series of military tribunals whose objectives were to prosecute prominent members of Nazi Germany. After his service, Carl, a World War II Veteran, returned home and enrolled into North Carolina State University where he followed his passion and studied biology, civil engineering and forestry. Upon graduation, he worked a bit for the North Carolina's Forestry Department, but was soon scooped up by Firestone Tire Company and sent to Liberia, Africa where he worked for four years on a rubber plantation. Carl was then contracted by the Liberian government to help with road planning and construction. After several years working for Liberia, and a short stint in Europe, Carl finally made his way home where he landed a job with the US Forest Service. For the next 33 years, he would course across the U.S. working as a forester, manager and staff director, eventually ending up in Atlanta. Upon retirement, Carl moved to his now home just outside of Clarksville, Georgia.

Carl's passion for honey bees began years before he retired when he purchased his first hive in 1962. He



Carl and Virginia being wed. ⇨



Carl examining the Russian stock.

said his love for biology and nature is what sparked his interest in bees and beekeeping. This interest would not only provide him with his second career but also would lead him down the path to meeting his wife, Virginia Webb. During our windshield time, we discussed his budding relationship with this “lovely women” in Atlanta. Carl had met Virginia at the Young Harris Beekeeping Institute and had been smitten (as we say in the South), ever since and for good reason.

Virginia Webb is a third-generation beekeeper. Her passion for bees and beekeeping began at a very early age when her father, Joseph Stephens presented her with a hive on her birthday in 1963. Mr. Stephens, now in his 90s, is still keeping bees in Tennessee. Growing up, Virginia and her father had a small business selling honey at local festivals. This small business grew and by 1965 they had 75 hives. The whole family became involved in extracting, bottling and selling honey. Later,



Virginia grafting for the upcoming season.

when they moved from North Carolina to Tennessee, they found themselves hauling colonies into sourwood country to take advantage of the bloom.

During her youth, Virginia would win local and national awards along with scholarships in 4-H, all involving bees and beekeeping and in 1995, she was the Tennessee State Honey Queen. After graduation, she moved to Atlanta but missed her involvement with bees, so she purchased a small farm where she could stick with her passion. This passion would grow beyond this small farm and it wouldn't take long before Virginia would make her presence known in Georgia and the world.

She became a member and officer of many local, state, national and international associations. Her involvement was key in many situations to better bees and beekeeping in the U.S. and elsewhere. Virginia became involved in the political arena as well, in particular, she lobbied on behalf of the beekeeping industry to the U.S. Congress and the FDA to start a National Honey Standard of Identity. Virginia has also been a mover and shaker in the world of honey shows and judging, her list of accomplishments go on and on. In 2005, she received her first Gold Medal for “Best Honey in the World” at the World Honey Show, Apimondia, in Dublin, Ireland. This would become a trend with her winning three more Gold Medals for “Best Honey in the World” in 2009 France, 2013 Ukraine, and 2015 South Korea. Virginia became the winner of America's Good Food Award for honey in 2015, 2016, 2017, 2018, and 2019. In 2014, she was the winner of “Best Tasting Honey in the World” sponsored by the Center for Honey Bee Research in Asheville, NC. Her other honey show ribbons would fill a room and would take up too many pages to list them all, oh, and did I mention she's an international honey judge as well.

Not only is Virginia a world class honey show presenter and winner, but there are many other awards. In 1993, she was the Georgia Beekeeping Associations (GBA) Beekeeper of the Year, in 2005, North Georgia Farm Woman of the Year, and in 2013 she was awarded “North American Pollinator Advocate.” This list continues, in 2014, she was the recipient of Eastern Apicultural Society's Beekeeper of the Year. Virginia is a current member of the Georgia Farm Bureau Honey Bee Advisory Committee and the first to achieve three Master Beekeeping Certifications in Georgia, Florida and the Eastern Apicultural Society. She's also presented 1000s of lectures on bees and beekeeping to many different organizations, not just beekeeping groups.

When something becomes an interest to Virginia, from politics to community, bees to beekeeping, honey integrity to judging, get out of her way, she means business and makes things happen. Virginia has also volunteered her time teaching beekeeping in Europe, South America, and the Caribbean, working with organizations like Farmer to Farmer. Back at home she volunteers at Lee Arrendale State Women's Prison teaching inmate's beekeeping in the vocational program. Virginia has been educating the public virtually her whole life. If you've ever been to one of her presentations, you understand when I say she is passionate about bees and beekeepers. When you visit with Virginia, her face lights up when you mention the word bees. She is a credit to her calling and has been extremely generous in her offerings to the beekeeping community and beyond.

Carl has also been involved in many associations



Carl extracting honey.

from serving as president of the Georgia Beekeepers Association (2000-2002), to the local clubs in North Georgia. His passion too, shines especially if you mention Russian honey bees. Carl purchased his first Russian queen in 2000, for \$500. He continued to purchase and rear Russian stock and in 2007, the Russian Bee Breeders Association was formed and Carl was the first beekeeper to be certified as a Russian breeder.

Both Carl and Virginia are selfless when it comes to helping beekeepers or the community understand the importance of our pollinators. After their marriage in 1998, they ramped up the business and haven't looked back. They've sold thousands of nucs and queens over the years and tons of honey. They sell honey online through their Mountain Honey website, www.mtnhoney.com and at home out of their adorable honey stand in their front yard. They've donated countless hours of time and energy and their efforts have been felt worldwide. They are such a positive force in Georgia, and we (and the bees) are lucky they have chosen beekeeping as a second career.

Let me end with my favorite memory of Carl and Virginia. One day years ago, we were driving around and he told me that he had proposed to Virginia a few days prior, but hadn't heard anything as of yet. I reassured him that any woman would be lucky to be his wife, but I could feel his frustration. After a long day in the field and



Honey stand outside their home.

many conversations about Virginia, we pulled into his driveway, and there on the front porch was a dozen roses. Carl opened the card, and all it said was, YES! Virginia had accepted his proposal and Carl was beaming. I was so proud to have been there for that moment, the moment a man's life was about to change, the moment when his path was about to lead him to a life full of happiness and love; cause in the end, that's what it's all about, right? Take care of you and your bees. **BC**

Jennifer Berry is the Research Leader at the University of Georgia Honey Bee Lab.

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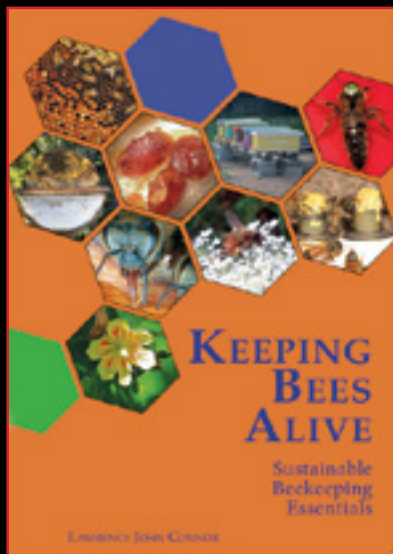
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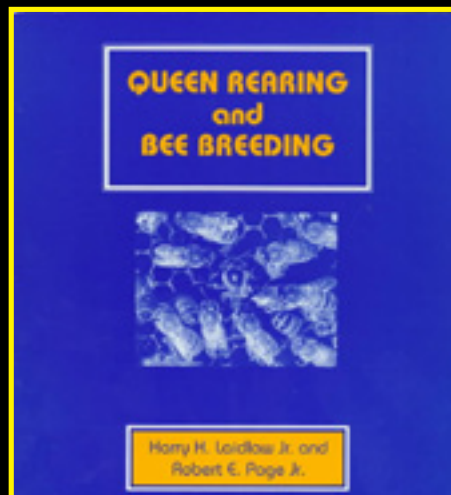
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Cuckoo McSwain

Stephen Bishop

A beekeeper forwarded me the following remarks about Cuckoo McSwain, recently buried in his dress bee suit, God rest his soul. With the beekeeper's permission, I have lightly edited his remarks for publication in case any of you were also mentored by Cuckoo and would like to share some of his sayings.

Many years ago, when I was a beginning beekeeper, I remember seeing McSwain. He still attended one or two beekeeper meetings per year, at which he always sat in the back muttering something about nonsense and foolishness. To be honest, his habit of talking to himself made me wonder if he was a few frames short of a full hive. Others whispered his mind was slipping, that he had forgotten the locations of his rumored 250 hives, big by local rumor standards, scattered throughout county farms. His neighbors thought he was crazy because he kept a few hives on his porch. The Postal Service refused to deliver his mail, which was fine by McSwain because he was saving taxpayer money.

The first time I personally talked to McSwain happened to be at the Post Office while he was checking his P.O. Box. It was fate, I suppose. I had just received a few queen bees in the mail. He saw my package that was marked with a bright yellow sticker, "Live queen bees."

"Boy, what you buying queens for? You'll go broke fast doing that."

I smiled politely. "These are Hygienic Mite Resistant Survivor queens."

He shook his head and muttered something about nonsense and foolishness and then walked out to his pickup truck. It's strange how once you've met someone for the first time, you'll notice them everywhere thereafter. There was McSwain's truck emerging from the woods. A few days later, he was opening a pasture gate beside the road. Then his truck was at the grocery store, bank, and so on. With a cloud of bees trailing behind, his truck was distinctive.

Then I parked beside the truck at the feed store. It was fate, I suppose.

"You're the boy with the queens at the post office?"

"Yes sir"

"How are they doing?"

"Well, one of them got balled and died."

"Is that right. Well, I noticed a couple of my hives with supercedure cells yesterday. If you're needing a queen, I'll cut you a cell."

That was the start of my mentorship by McSwain. At the time, I was in my mid-20s and McSwain was in his mid-70s. We both found each other equally amusing and exasperating at times. Let me revise that, sometimes he seemed exasperated with me and amused with my wife. Our wives would talk and watch from a safe distance while we "fooled with the bees," he with absolutely no protective gear and me in a full suit. His wife had the habit of digging up flowers to send home with my wife, and I often left with a swarm on the back of my pickup truck. I'm not sure which had the worse odds for surviving the winter, the flowers or bees.

At times, I thought McSwain was a certified loon. He did have three hives on his front porch – he said it was "to keep the riff-raff away." Sometimes he would stick his bare hand into the mass of bees bearding on the front of the hive--just for fun. And sometimes he would say such crazy things as, "If you don't take care of your bees, then they're gonna die." For many years, I wondered if McSwain's memory was failing because he never remembered my name and always referred to me as "boy" or "the boy with the bees." In the Spring, I would come home from work and a scrap of paper would be wedged between the door and door jamb. Although I had given McSwain my phone number dozens of times, he always left notes on paper scraps: "Boy, got swarm. Come get bees."

He once told me that he started himself as "the boy with the bees" then progressed to the "the boy with

all the bees" and then graduated to the "bee man." Finally, he received the honorary title "old fool with the bees." He said it was one of life's greatest honors when his neighbors started considering him "a bit cuckoo."

As best I could tell, McSwain was mostly a bee hoarder – although he had the strange habit of giving away his valuable swarms. At one time, "eons ago," he harvested honey by the barrel load when he ran 250 hives. But as best I could tell he only had about 50 hives "flying" now, and he only harvested honey from a few of those per year. As you can probably imagine, a lot of swarms exited those honey-bound hives, which was good because I needed to replace my winter losses. Oddly, he didn't lose many hives. For a while, I suspected my losses were because his bees weren't adapted to the harshness of my microclimate 10 miles away.

After several years of watching and learning from McSwain, and about the time he started referring to me as the "boy with all the bees," it seemed my bees had finally adapted to the microclimate, and I started overwintering hives with great success. I'm ashamed to say that by that point I had more bees than I knew what to do with, and I actually started declining some of McSwain's swarms. He didn't seem to mind because he happened to run into another young beekeeper at the post office or grocery store who needed bees to replace winter losses. According to him, his pickup truck with the cloud of bees and still smoldering smoker on the back often "attracted the loonies."

As life got busy, I saw less and less of McSwain, but I'm glad fate led me to his truck. To commemorate McSwain, God rest his soul, here are some more of his sayings, wise and otherwise. Take them with a grain of salt, knowing they originated from a man many called "Cuckoo."

"Bees are like cows. The more you work them, either the tamer they get or the tamer you get. Open a hive that hasn't been worked in a long while,

and it's likely to gore you in the butt."

"All beekeeping ain't local. A good beekeeper could keep bees anywhere and a bad beekeeper could kill bees everywhere."

"It ain't the honey; it's the stings, heat stroke, and bad back that make beekeeping so satisfying."

"Everyone exaggerates their number of hives, honey supers, and stings. Never trust a person who hasn't been stung."

"If you talk to the bees and the bees talk back, it's best to change your smoker fuel."

"If you drop a box of bees, the five-second rule don't apply."

"Swarms ain't worth dying for – unless they're in April and bigger than a July watermelon."

"Beekeeping is basic math: bees multiply, you divide."

"If neighbors don't like your hives, get more: they'll move."

"The real money in beekeeping is at the bank; just don't wear your veil inside to get it."

R.I.P. Cuckoo McSwain. **BC**



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Working Success Into Beneficence

Grai St. Clair Rice

Megan Denver and Jorik Phillips are the dynamic duo who run Hudson Valley Bee Supply in Kingston, NY. Mostly they are known as Megan and Jorik. In a few short years, they have created a successful business engaging their passion for honeybees. They continue the journey by "giving back" to support honeybees and beekeepers in impoverished communities on the other side of the world.

Here are pieces of their story, which I hope will inspire others to follow their own passions to help honey bees. With vision, energy, community, synergy and the blessing of honeybees, we can each make some inroads towards a better world. No time to waste . . . There is much to be done.

Bee Fore

Beekeeping is a magnet for interesting people. Megan Denver started beekeeping in 2005, after settling in her own home in Woodstock, NY. She had lived a bicoastal life for much of her youth, but knew she needed to be near the woods and four seasons. At the Catskill Mountain Beekeepers Club (CMBC), Jorik Phillips was presenting a Queen Rearing talk in 2009 when they met. Jorik had come to beekeeping in 2003 thru his love of mead making. Once hooked on beekeeping, he readily took to expanding his apiary through queen rearing, and built up to 125 colonies in seven or eight beeyards in a short time. "I take little pleasure from doing things on a small scale," Jorik laughs.

In 2010, Megan helped Jorik remove a long established colony from an old barn. She was intrigued by where the other wild bees were, and fashioned a beelining box to follow her interest. She encouraged Jorik to place 50 mating nucs near long established bee trees in upstate NY to harness their survivor genetics. By 2011, Megan was doing the CMBC newsletter and Jorik became

the President.

Ideas were flying. Together they produced a run of educational Youtube videos from 2011 through 2012, and were in the idea stage for setting up the Hudson Valley Honey Company, to offer "zip code" local honey.

A Pivotal Year

As 2012 unfolded, Megan and Jorik's beekeeping interests, interpersonal skills, business acumen and a fair dose of luck, turned into vast opportunities. That Summer, at a NY Bee Wellness workshop, organized by Pat Bono to train beekeepers to recognize bee diseases and train other beekeepers, Megan and Jorik became friends with Dr. Diana Sammataro, then a Research Entomologist at USDA's Tuscan Bee Lab (co-author *Beekeepers Handbook*), who was one of the instructors. As this camaraderie developed and expanded, doors also began to open to other introductions in the beekeeping world.

Within days of the Bee Wellness Workshop, they attended the 2012 Eastern Apicultural Society conference in Burlington, VT. At the Thursday night dinner and auction, which is a fundraiser for EAS programs, an old beelining box was put on the block. Megan was determined to be the winning bid against Aaron Morris, then President of the Empire State Honey Producers, and Dr. Thomas Seeley (*Honeybee Democracy & Wisdom of the Bees*). The bidding was fierce and fun in a room packed with beekeepers. Megan was victorious and the exchange was perfectly entertaining.

Seeley came over to Megan's table, and discussed their mutual fascination with bee hunting, which has informed much of Seeley's research work in Maine and Ithaca since the 1970s. They both are fond of George Harold Edgell's 1949 book *The Bee Hunter*.

Megan convinced Seeley to do

a casual beelining demo at lunch the following day outside the Davis Center, following his morning talk “Honey Bees in the Wild.” He had never before attempted a demo of bee hunting to a group of eager beekeepers. No surprise that the beeline pointed directly towards the EAS Apiary on the university grounds. This was the beginning of a wonderful, and productive relationship.

Starting Hudson Valley Bee Supply

In the Fall of 2012, Megan decided to turn an unused building on the grounds of Costanzi Crane Co in Kingston, NY into Hudson Valley Bee Supply (HVBS). The goal was to teach beekeeping to all levels, and offer Mead and candle making classes. The bread and butter would be selling the necessary supplies and bees to the burgeoning community of beekeepers. Megan’s talents in graphic design and multi-tasking abilities, plus Jorik’s skills with woodworking, set them in good stead for the initial set-up. They were encouraged to have a business plan, however that never panned out.

With an investment of \$30,000 for fixing up the building and buying inventory, the shop opened on January 1, 2013. Every year since, they hold an Open House on New Year’s Day, for all who wish to come and celebrate.

“We were successful within our first three months,” tells Megan. “It was sometimes very stressful, and I would be in tears that we had run out of smokers again.” It turns out, all things came together to spur on their success with HVBS.

“Location, location, location,” Jorik exclaimed. The location turned out to be perfect for the convenience of customers to reach them by car. It was just up the road, or over a bridge, or off a NY State Thruway exit, depending on the point of origin. Unexpectedly, it is also a perfect place for a beeyard, with a plethora of forage throughout the year. The Hudson Valley plays a part in their success, with farming an influential part of local culture, a healthy television production industry hungry for honeybees, and a density of people who can afford to become beekeepers.

From the beginning, they are not interested in shipping, thus customers come to them. This model

is its own success for HVBS. They rarely update the website, plus have limited hours, open only 25 hours per week, but no one seems to care. In fact, the face time built a rapport with customers, and word spread like wildfire.

Everyone who knew them from the local bee clubs wanted them to be successful. Catskill Mountain Bee Club members volunteered during bee handoffs, and other friends arrived with food during the crunch times of the first year. Volunteering became a “thing”, and in subsequent years, colorful T-shirts emblazoned with “Worker Bee” were proudly worn by those who helped during the push at package and nuc handoffs.

Megan and Jorik attended just about every bee club meeting for many miles around every month, for a good part of three years. They donated hives for raffle items, marketed feverishly, spoke for free at most places that asked, worked social media, labored seven days a week, and poured the financial success back into the business. All around it was a herculean effort that generated incredible momentum for them personally and professionally.

The Shop

The shop itself in a charming 450 square ft space, including a classroom with tables and chairs for twelve students. The display of wares is aesthetic, and feels oddly uncluttered considering how many interesting tools, hives, spinners, clothing, honey and books HVBS has to offer, including a special “Table of Joy” for stocking stuffers during the winter holiday season.

There is an observation hive on the wall near checkout, which is infinitely interesting and always popular. It is a “Swing View” model made by Bonterra Bees, which houses a full colony of eight deep frames, with glass on two sides

Even as HBVS has grown, the feeling in the shop remains intimate. Customers stop by to pick up supplies, and many stay to chat. Every beginning beekeeper has more questions than answers, about what they are seeing and what to do next. Megan and Jorik, and the others tending the shop, are extraordinarily generous with their energy and knowledge if time allows. At times, the shop feels like a club house.

“One day there was a line of people I was trying to get to,” Jorik explains “and, at one point I look up to see a customer who wears \$800 shoes talking to another customer who usually has cow poop on his shoes, deep in conversation about their bees. Now that’s cool.”

HVBS now has 10,000 square feet of storage on location, including a wood shop. A few years ago, they added eight outbuildings which are decommissioned cell tower pods, that sit as windowless, vented cement cubes in the back parking area. These vessels have proved incredibly useful in expanding space, with one for honey spinning, one for soap making, and others for storage of honey supers and glassware.

Adventures with Dr. Seeley

In the Summer of 2013, Megan arranged for Dr. Seeley to present a talk and a bee hunting session for the Catskill Mountain Bee Club in Acra, NY. Seeley brought his bee

*Megan Denver
and Jorik Phillips,
Hudson Valley Bee
Supply, August
2019 © HVBS*





Bee hunting in the Arnot Forest, Cornell University. July 2015 © Jorik Phillips

hunting gear, and Megan had one of her own making. It was known that a member had a beeyard relatively close by, so some success was expected. The group watched Seeley patiently catch, feed and mark bees, and wait for their return. Then, move the table with bee box in the direction the bees had flown upon release, to do it all again. Within a relatively short time, much to Seeley's surprise, a colony was found in an abandoned garage nearby.

In 2014, Seeley extended an invitation for Megan and Jorik to join him bee hunting in the Arnot Forest, a 4,500 acre Research Forest owned by Cornell University, where Seeley has been studying honeybees in the wild for decades. "Almost always, I do my bee hunting by myself, because most folks are not able to spend the time needed to locate a bee tree. On average, it takes me about 1.5 days of steady hunting, to line my way to a tree in the woods," Seeley explains. Megan encouraged Seeley to write a book, offering to take the pictures.

"A special thing about bee hunting with Megan and Jorik was their constant enthusiasm and good cheer," Seeley relates. "Also, the excellent photographs that emerged from bee hunting together. The most special of these are the photos of the

nest entrances high up in trees that they took with the help of a camera mounted on a drone."

After a few visits to the Arnot Forest, and also a visit to the John Burroughs homestead, Seeley dug in to write. Following the *Wild Bees: the craft and science of bee hunting* by Thomas D. Seeley was published by Princeton University Press in 2016. In advance of publication, Megan set up a "Following the Wild Bees" Facebook page which still follows Seeley, and includes his recent publication *The Lives of Bees*. HBVS put a bee hunting box into production, replicating Seeley's, made in black walnut by a local wood artist.

The Farm

In 2015, Megan and Jorik were looking for land to buy for a new out- yard, to add to their honey production yards. They came across a 57 acre property in East Durham, with a rundown 1830s farmhouse. It felt just right to Megan, who named it Patent Wall Farm, for the distinct stone walls outlining the property.

A mating-nuc yard was set up early in 2016. They then dug in to planting vegetables, learning how to work farm machinery, and figuring out what to do with the bounty when ready for harvest. Megan warmly calls the time there "Farm Sunday", since that's when they dedicated time to the land and sharing meals with friends.

Late in 2016, they met people at a nearby farm growing echinacea and tending hives for Pharmacy Beauty, a skincare product compa-

ny. By 2017, Megan and Jorik took over the relationship with Pharmacy, planting more Echinacea Green Envy each year since. HBVS bees produce echinacea honey, which is a rare commodity, and a portion of the roots are harvested for their medicinal qualities for Pharmacy products. By 2018, Patent Wall Farm was certified organic.

Expanding into the Giveback

At the end of 2016, Megan and Jorik were invited to the first Bee Audacious, a "collaborative working conference" of thinkers and doers in beekeeping, inspired by Mark Winston's "Manifesto" published in *Bee Culture* in 2015. Breakout sessions were designed for deep conversations and forward looking. At this event, Megan connected with Nicola Bradbear, the founder and Director of Bees for Development, the international organization "which promotes sustainable beekeeping to combat poverty and to build sustainable, resilient livelihoods."

When Megan traveled to the BfD headquarters in Wales in May 2017, Bradbear asked her to be the North American Ambassador for BfD, to promote visibility and to help raise funds for upcoming projects. "Hudson Valley Bee Supply had become so successful," Megan explains "We thought it was time to give back. BfD is an impeccably run organization, helping the poorest people to become self-sufficient through beekeeping, in a way that does not create donor dependency."

Megan discussed her developing interest for BfD with Dr. Seeley only to find out that he has been a long-time supporter, and had been invited to be a Patron of BfD around 2011. By 2018, Megan founded Bees for Development North America, a 501(c)(3) fundraising arm of BfD. Jorik and Seeley are on the Board of Directors.

The Hudson Valley community was rallied once again, as Megan organized local fundraisers, and tabling events, plus sharing her experiences traveling for BfD in Ethiopia late in 2018. Megan successfully launched a GoFundMe campaign in March 2019 for a new project just getting off the ground in Ghana, helping to turn honey hunters into beekeepers. In the under-developed eastern region of Ghana, honey hunters depending on bees to sup-



Bee Hunting Box in production by HVBS © Megan Denver.

port their families have been displaced by the creation of the Digya National Park. Poverty forces them into conflict with park officials, as they need to collect honey to survive.

BfDNA, took on the final fundraising for the pilot program to teach selected men and women in two villages how to build fixed-comb hives out of available material, as well as manage hives and harvest honey. This is a three-year pilot project that will be measured at intervals for effectiveness and viability going forward into other villages. BfD projects in Zambia and Uganda are also in funding stages.



At the Apimondia International Beekeeping Congress in Montreal this past September, Bradbear invited Megan to join the Apimondia Scientific Commission for Beekeeping for Rural Development. This Commission provides opportunities for people involved in promoting apiculture as a means of relieving poverty to share information.

In a more local venue, Megan joined the Board of Pollinator Partnership in March 2018, and participates in their "Bee Friendly Farming" Taskforce.

Bee Dialogue

Beekeeping has the potential to raise awareness, alleviate poverty, broaden experience and shine a light on ways to think about community. Bees can set good examples for humankind.

Megan likes to say, "When you keep honey bees in the backyard it can lead to a conversation at the dinner table about the importance of bees. Then, maybe that conversation goes to the work place and on to the board room, and even to their financial advisor about investing in companies that are forward think-

ing in the the care of all pollinators. Honey bees are making an impact on peoples' lives every day and I'm humbled to be a part of that." **BC**

<http://www.hudsonvalleybeesupply.com/>

<http://www.beehunting.com/>

A website created to support interest in Following the Wild Bees, by Dr Thomas Seeley, and the adventure of bee hunting

<http://beesfordevelopment.org/our-work/>

International beekeeping organization which promotes sustainable beekeeping to combat poverty and help build resilient livelihoods

<https://www.beesfordevelopmentnorthamerica.org/>

The North American fundraising arm for BfD

<https://www.youtube.com/watch?v=Pbfj2kse-s>

Where Bees Lead - video by Bonnie Morse from Bee Audacious

Grai St. Clair Rice is co-founder of HoneybeeLives in New Paltz and NYC. She teaches organic-Biodynamic beekeeping, plus writes and lectures about honey bees.

Megan taking notes in Mizan Teferi, Ethiopia December 2018 © Megan Denver.





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Tell Me About Your Early Years Archie

Jerry Hayes

Have you ever met anyone that was totally new to your life before? Maybe met them at a bee meeting or a community social event and had a conversation with them and then the meeting is over or the event closes and life goes on and that link is broken. But, when a question comes up like the one Kim asked about interesting people to interview for Bee Culture that person name came up strongly from someplace stored in your brain hippocampus where memories are stored and indexed for later access.

For me, that person is Archibald (Archie) Mitchell. I asked Archie a bunch of questions and he took off with them and ran.

Tell Me About Your Early Years

I graduated from Hamilton High School in 1964 and a few months after graduation, I enlisted in the United States Air Force. This was during the Viet Nam War and although I volunteered for Southeast Asia, I served all of my duty overseas at RAF Wethersfield, England. I played football and became involved in boxing. During my tour, I won the USAFE Light-heavyweight Championship. In 1969, I was honorably discharged.

I moved to Leavenworth, Kansas and worked for the Federal Bureau of Prisons. My initial goal was to become a Special Agent with the Federal Bureau of Investigations.

That wasn't to be.

Looking back over the years, I often ask myself, "How did I end up in Federal Prison": after all, I never committed a crime? The answer is simple: I was a college Drop out! I was married, my wife was pregnant and I needed a job.

Therefore, I started my career at the United States Penitentiary (USP) at Leavenworth, Kansas more than

20 years ago, October 1977 and retired from the United States Penitentiary at Lompoc, California in 1997. My initial plan was not to stay incarcerated for 20 years!

How did I survive 20 years of 'confinement,' also known as employment in a maximum-security federal penitentiary?

There were three keys to my survival: Beekeeping, the USAF Reserve and community involvement including the Lompoc Valley Distance Club and the Police Activities League Boxing Program.

I started the Lompoc Boxing Program over 30 years ago to help youngsters stay out of trouble. We worked with the Police Activities League (PAL) for several years before becoming independent. This program is still going strong in Lompoc. I was very involved in the Southern California Amateur Boxing Programs for many years as a coach and official. In 1984, I worked with the Olympic Organizing Committee as a volunteer (Boxing Competition Manager). The 1984 Olympics in Los Angeles was one of the most successful from a financial perspective. I have also followed and attended several of the Olympic Games including Seoul in 1988; Atlanta in 92, Sydney in 2000 and maybe Los Angeles, again? While growing up in Memphis, Tennessee my athletic interests were Track and Field events and I competed in the mile, the 880 and against other high school relay teams. My other interests were hunting and fishing.

But, Honey Bees, what they do and how they do it has been my inspiration.

WOW, YOU CERTAINLY HAVE BEEN BUSY. AT LEAST YOU WEREN'T BORED. EXPAND ON THIS LOVE OF HONEY BEES THAT YOU DISCOVERED.

I became involved in Beekeeping while working at USP Lompoc after Bill Baron, a co-worker now deceased, asked me to help him manage a few hundred colonies. This was one of the best things I could ever have happened in my life when I stop and pause and reflect on all my positive experiences associated with beekeeping. I learned quite a lot from Jeremy Rose of the California Bee Company also. He has over 500 hives and I helped him move hives to pollinate almonds in Kern County. We also sold produced queens and sold nucs to local beekeepers. I assisted Jeremy in editing his book titled "Beekeeping in Coastal California" Of course, I read both the *ABJ* and *Bee Culture*. I have copies of them that are more than 30 years old. However, it is always so interesting to read the old issues of the because not much has changed in Beekeeping after all these years.

The bees always give me an opportunity to pause and reflect on one of the greatest wonders of our universe, to consider how insignificant we are as humankind. Working with bees makes me humble and appreciative of how lucky I have been to have this opportunity the majority



Archie and his daughter.

of humankind will never experience.

Beekeeping was also my therapy while working in the USP and especially after many hours of overtime writing reports, conducting unit team reviews, interviewing inmates after a killing, an assault, an escape or other prohibited act.

I learned beekeeping through “on the job training” OJT and continue to learn from reading, bee conferences and daily experiences with these “girls and boys” in my colonies and also in the wild, especially on the 100,000 acres comprising Vandenberg Air Force Base where I remove swarms and colonies.

As a beekeeper and a Western Apicultural Society member and Regional Director for California, I have continued to fulfill my quest to learn about honey bees around the country. For example, after attending my first WAS Conference in Buellton, CA, over the past 15 years I have attended WAS Conferences at sites including Seattle, WA, Santa Fe, NM, Eugene, OR, Victoria BC, Missoula, MT, Boulder CO, Tucson AZ, and more. It truly has been fun. Membership with the California State Beekeepers Association has also allowed my travels to various parts of California for the annual state beekeeper conferences. Perhaps, the highlight of all my beekeeping traveling is set for this Nov. when I will visit Cuba and learn more about Beekeeping there.

For many years, I was the only beekeeper in my town to collect and remove swarms. This scenario ended several years ago when I decided to write a grant for the Lompoc Valley Beekeepers Association. We received funding from the Santa Barbara Foundation and enlisted the assistance of two other club members, Jim Rice, and Kate Griffith

to help manage this effort. The Club has grown to more than 50 members and continues to grow as more locals become more concerned about the decline of honey bees and seek to help.

Looking ahead to the future of Beekeeping, my number one goal is to work with local beekeepers and others to get the city ordinance changed to allow beekeeping in the City of Lompoc as I advance in this journey in life.

I have to pause and give thanks to all those beekeepers and entomologists who have helped me along this journey including Dr. Adrian Wenner who gifted me a most valuable resource, the “Selected Papers, and Biography of Charles Henry Turner (1867-1923 – Pioneer of Comparative animal Behavior Studies).

And others including Dr. Eric Mussen, now retired and always a very responsive and helpful resource whether the issue is AFB or the El Segundo Blue Butterfly.

Then there are those whose literature and research I have referred to on countless occasions including Dr. Dewey Caron, Dr. Diana Sammataro, Dr. Larry Connor, Dr. Dave Kellum and Jeremy Rose, one of my mentors and author of *Beekeeping in Coastal California*. I almost forgot Randy Oliver and his website which is at the top of my list.

WHAT WORDS OF WISDOM WOULD YOU LIKE TO LEAVE WITH US?

To be invited into an insects world, to learn how to compare and contrast and be humbled because they are smarter than we are is truly a Gift. Be aware of Gifts and show gratitude for them. **BC**

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Beekeepers have been selecting for bees that produce less propolis for quite a while now. Many beekeepers just call it “bee glue,” and wish their bees would stop sticking everything together. As glue, it is amazing stuff. Sometimes it is possible to pick up an entire Langstroth hive by the upper hand-holds and have it all stick together from bottom board to inner cover. Why the bees feel so compelled to glue the frames in place is hard to understand, but they are quite good at it. Propolis is amazing for other reasons, too, most of which are very positive for us and for the bees. It is so amazing that we should really be selecting for bees that produce more propolis, not less.

In the wild, bees commonly create what is known as a propolis envelope around the colony, smoothing and water-proofing the rough interior of hollow trees. They can be encouraged to do this in our man-made hives as well, if we roughen the walls either with a wire brush, or by tacking propolis traps to the walls. The reason we would want a propolis envelope around our bees are the qualities other than stickiness. Propolis is anti-bacterial, anti-fungal, and antiviral. That means it helps the bees conquer AFB, EFB, nosema, and the viruses that work against our girls by working directly in their immune systems. Colonies had greater colony strength and vitellogenin levels after over-wintering with the propolis envelope in a study done by Marla Spivak, et al at UMN.

Also interesting are the properties that are beneficial to humans. The flu, colds, and viruses are all things that propolis can be helpful against. Propolis is even anti-tumoral. It

contains flavonoids, iso-terpenoids, phenols, and fatty acids like palmitic acid, keampferol, quercetin, caffeic acid, and functions as an antioxidant. In case you aren't a chemistry major or a health food nut, all of those things are good for us and for our bees. When I am working my bees, I often just pop a chunk of propolis in my mouth. Then it gets stuck in my teeth just about the time I realize it is one of the really spicy ones. One of the things mentioned at Apimondia last week was that chewing almonds with the propolis will keep it from sticking to your teeth. The more common way to use propolis is in a tincture.

We can harvest propolis by scraping it off of our hives, frame rests, and frame shoulders, but this will be kind of dirty from the traffic, bee legs, and other fun things it contains. The better way to collect it is to use a propolis trap. This inexpensive item looks like a queen excluder with spaces too small for any bee to pass through, with ridges that feel rough to the bees and cause them to want to cover it. Quite a bit of propolis can be harvested for resale with traps. My local herbalist will pay \$40 per lb. for uncleaned propolis, and I have heard of clean propolis going for up to \$80 per lb. The propolis trap goes on top of the uppermost hive body, and will be filled even faster if the cover is elevated just enough to let some light in to irritate the bees (and the small hive beetles and wax moths won't like the light, either). As always, we need to work with what the bees are doing, rather than trying to make them do what we want them to do. If there is a major honey flow on, as in early Spring, the bees won't be interested in collecting propolis. In late Summer and early Fall, the bees are already thinking about propolizing everything in sight, so we work with that.

Once filled, the propolis trap should be frozen for 24 hours. Remove the trap from the freezer and bend and roll it to cause the now stiff propolis to fall onto a cookie sheet. Now the little chunks of propolis can be cleaned for the first time. Scrape it all into a container of cold water. The propolis will sink while beeswax and other debris will float. Skim off the junk and drain the water. Return the propolis to the freezer along with a dedicated coffee grinder (it will be

Propolis' Benefits To Bees And Humans

Collecting, Cleaning, Recipes

Tina Sebestyen



"Honeybees are the backbone of agriculture"

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forever sticky after chopping up the propolis). Once well frozen again, remove the propolis and coffee grinder from freezer. Working quickly, since the propolis will thaw in minutes, pulse in coffee grinder to make it a powder. Running the grinder for too long will heat it and the propolis, and glue everything together. Once the propolis is powder, or is in pieces small as you can get it, (like 1 mm) you are ready to make the tincture. Tinctures can be made with alcohol, oil, or water. Each substance will pull a different array of components from the propolis, and will function differently depending on how it will be used. For instance, oil and water don't mix without an emulsifier, so for lotion or eczema cream, an oil



tincture will combine with the other cream ingredients more readily. A water extract might be used for nasal spray, facial cleansing, or in a cream. Fat or oil extract can be used for soap, cosmetics, burns, or eczema cream. Alcohol is most often used to make tinctures, as it is the most effective at extracting the widest range of beneficial properties from the propolis.

For a water extract of propolis, use a 1:3 ratio of propolis to water by weight. For example, add 25 grams of propolis to 75 grams of water, shake twice daily for two weeks, or boil for 60 minutes, cool and filter. Please note that heating can cause the loss of some of the beneficial components. It will keep for four years. Oil is not very effective for dissolving propolis, but if this method is most desired, add 20 grams of propolis to 80 grams of olive or almond oil, shake twice daily for two weeks. For a more effective oil extract, use both oil and alcohol with the propolis, then remove the alcohol using heat. The

recipe is 30 grams of propolis, 70 ml olive oil, and 60 ml of 70 - 95 proof ethanol (vodka works great). After the two weeks of twice daily shaking, filter through a paper filter like a coffee filter, and stand the bottle in a water bath. Simmer gently with the lid off for 30 minutes to remove the alcohol. The oil extracts certain components, while alcohol extracts different ones, so combining the two creates a more potent medicine.

Alcohol is very effective at extracting the greatest number of beneficial ingredients. Use only ethanol alcohol (grain alcohol, the kind you drink), not isopropyl or rubbing alcohol, which is poisonous. The recipe is 20-25% propolis to 75% alcohol, (70 proof) by weight, shake twice daily for two to four weeks. This can be filtered through a paper filter, or not. Leaving the spent propolis in the bottom of the bottle won't hurt anything, and will add a bit of potency to the product.

Medicinal uses of propolis are wide-ranging; anemia, respiratory infections, dental care, skin care such as wound healing, eczema, and burns, cancer treatment, digestive issues like Candidiasis, and much more can all be helped by propolis. Alcohol extract of propolis is so highly anti-oxidant that it will even protect against gamma radiation. There are some rare people who will be allergic to propolis, such as those who are allergic to pollen or bee stings, asthma patients, and pregnant women. It might be wise to test a small area topically, twice, to be sure you won't be sending anyone to the hospital, though these types of true allergies are rare. The dosage of propolis in a tincture can vary



depending on the concentration, but a standard is 15-20 drops in a glass of water or juice, or with a spoonful of honey. (standard disclaimer, if you have never taken propolis before, you should talk to your doctor first. Stop immediately if you get hives, a rash, itching swelling of face, hands, or throat).

Propolis is excellent when used for skin care. Even septic wounds can be healed with a mixture of propolis and honey, with no scar tissue left behind. A mixture of seven parts honey to three parts powdered propolis should be applied three times daily. Cold sores go away more quickly when either propolis ethanol or water tincture is used. Here is a simple Face Cleanser with Propolis, from the Canadian Apitherapy Association, from the Apitherapy Workshop at Apimondia, Bee Products for the Skin by Stephanie Frechette.

Propolis Face Cleanser

- 10 grams honey
- 30 grams jojoba oil
- 5 drops propolis tincture
- 3 drops Vitamin E oil

Mix well, shake before use, massage into skin daily, rinse with water.

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Tina has been keeping bees since 2007 in top bar, Langstroth, and more recently, the long Langstroth hive. She is founder of the Four Corners Beekeepers Assoc, and is vice president of the Colorado State Beekeepers Assoc. She is currently working to produce the Master Beekeeper Program for the state of Colorado. She helps with large scale queen production for commercial operations, raises locally adapted queens for SW Colorado, helps produce nucs, does structural removals of bee colonies, and writes and speaks about bees everywhere she gets the chance. She can be reached at bee.seeking@gmail.com

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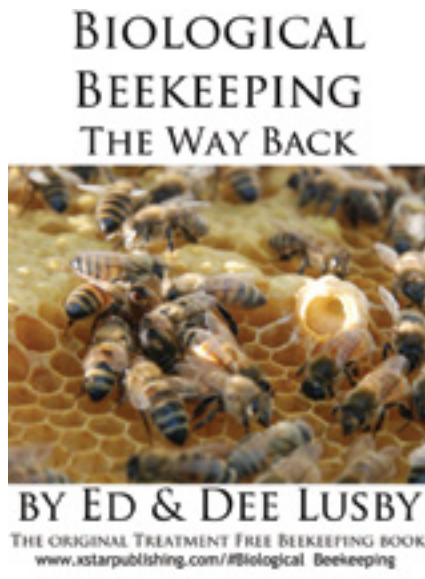
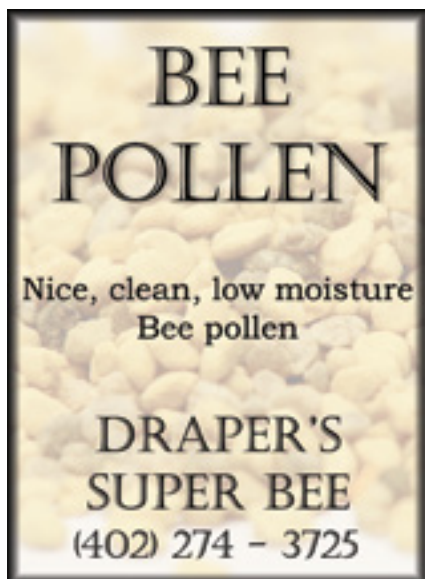
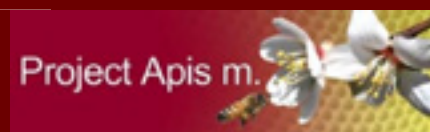
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A South Pacific island saved by U.S. Marines in a 1943 battle that cost them 1,000 dead and 2,300 wounded is losing its fight to survive climate change.

The 76 hours of what is called the toughest battle in Marine Corps history – the freeing of Tarawa, now named Kiribati – also saw 97% of the 4,800 Japanese defenders killed.

But today Kiribati, 1,840 miles southwest of Hawaii, is facing a new enemy as a rising ocean breaks through freshwater ponds, threatening communities and forcing some to be abandoned.

Two islets are underwater and some scientists and politicians say Kiribati, with its 100,000 population and maximum 6.5 ft. of elevation, will be the first country that will disappear because of global warming.

Prof. Simon Donner, a climate scientist at Canada's University of British Columbia who has spent years studying the situation in Kiribati, tells *Bee Culture* the island country is "certainly" existentially threatened by sea-level rise.

"The mean sea level and Spring tides are clearly increasing, he says.

"The rising seas and higher tides are not necessarily just claiming land: they are reshaping the islands by changing when and how sand and other material is deposited and eroded."

Donner says the islands may not "disappear," as is usually reported in the media.

"But they will become prohibitively expensive to inhabit, as high tides damage homes and infrastructure, and saltwater infiltrates the local water supply."

Climate scientist Ruth Lorenz of the Swiss Federal Institute of Technology in Zurich says climate change is increasing the number of days of extreme heat and decreasing the number of days of extreme cold in Europe faster than models project.

The number of Summer days with extreme heat has tripled since 1950 and the season has become hotter. The number of Winter days with extreme cold have decreased by at least half, while Winters have grown warmer.

As a result, beekeepers in Spain have moved more than one million Iberian black bees 3,940 ft. above sea level to protect them from rising temperatures.

The apiarists in Girona acted as climate change and extensive agriculture threatened the bees' survival. The hives now are located beside tall trees, providing them with shade from the Spanish heat.

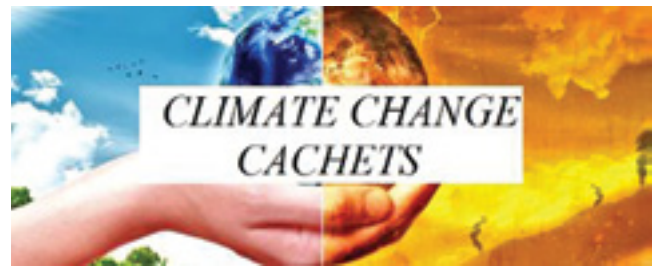
In Russia, *The Moscow Times* reports climate change may be playing a greater role in killing of the country's honey bees than officials care to admit.

The newspaper says that from the Moscow suburbs to the Altai republic 2,500 miles to the east in Siberia, millions of bees were lost this past Summer.

Mass bee deaths were cited in 24 of Russia's regions and 300,000 bee colonies died off during June and July – peak months for honey harvesting.

Along ocean coasts, climatologists say the waters are rising because the 5.4-million-square-mile Antarctic ice sheet containing 7.2 million cubic miles of ice, and the 656,000-square-mile Greenland ice sheet – as well as glaciers around the world – have been melting faster in the last 20 years than in the past 10,000.

Since 2003, Greenland has lost 281 billion tons of ice annually to melting, studies show.



Alan Harman

The planet's rising temperatures cannot be ignored anywhere in the world, experts warn.

Scientists say when water heats it expands, and about half of the rise in sea levels over the past 25 years is attributable to the water occupying more space.

Intergovernmental Panel on Climate Change (IPCC) researchers found that in 2014, global sea level was 2.6 ins. above the 1993 average and the average continues to rise at a rate of about an eighth of an inch a year.

Scientists predict that around the same time Kiribati becomes uninhabitable, southern Spain and other parts of Europe will become dangerously hot and dry.

As well, coastal cities around the world will flood, while wildfires in the Arctic will become normal.

Human flight or fight has already begun.

Indonesian President Joko Widodo, for example, recently announced a US\$34-billion plan to build a new capital city in the east of Borneo island. Jakarta, the present capital, is in trouble after decades of depletion of groundwater reserves, rising sea-levels, and increasingly volatile weather patterns. These are combining to cause large areas of the city to disappear underwater.

And in Singapore, Prime Minister Lee Hsien Loong says it could cost more than US\$100 billion over the next century to protect his island country from rising sea levels, hotter temperatures and more intense rainfall.

The IPCC declares in its latest report that keeping global warming to well below its 2°C (3.5°F) target can be achieved only by reducing greenhouse gas emissions (GHG) from all sectors.

Panel Chairman Hoesung Lee says the report shows that better land management can contribute to tackling climate change, but is not the only solution.

Land must remain productive to maintain food security as the world population increases and the negative impacts of climate change on vegetation increase, the study finds.

This means there are limits to the contribution of land to addressing climate change, for instance through the cultivation of energy crops and afforestation. It also takes time for trees and soils to store carbon effectively.

Jim Skea, co-chairman of an IPCC report working group, agrees that land plays an important role in the climate system. "Agriculture, forestry and other types of land use account for 23% of human GHGs," he says.

"At the same time, natural land processes absorb carbon dioxide equivalent to almost a third of CO₂ emissions from fossil fuels and industry."

Hans-Otto Pörtner, co-chairman of another IPCC

Another food concern is how climate change is becoming a major threat to honey bees.

working group, says the report shows land already in use could feed the world in a changing climate. “But early, far-reaching action across several areas is required.”

Kiyoto Tanabe, co-chairman of a task force on national GHG inventories, asserts that the choices taken on sustainable land management can help reduce and in some cases reverse the adverse impacts.

“In a future with more intensive rainfall the risk of soil erosion on croplands increases, and sustainable land management is a way to protect communities from the detrimental impacts of this soil erosion and landslides,” he says. “However, there are limits to what can be done, so in other cases degradation might be irreversible.”

The IPCC report finds climate change is affecting all four pillars of food security: availability (yield and production), access (prices and ability to obtain food), utilization (nutrition and cooking), and stability (disruptions to availability).

Report contributor Debra Roberts notes some dietary choices require more land and water, and cause more emissions of heat-trapping gases than others.

“Balanced diets featuring plant-based foods, such as coarse grains, legumes, fruits and vegetables, and animal-sourced food produced sustainably in low GHG systems, present major opportunities for adaptation and limiting climate change,” she says.

IPCC report contributor Panmao Zhai says there are things already being done, including using technologies and good practices, but they need to be scaled up and applied in other areas.

Scientists say human use directly affects 69%-76% of the global ice-free land surface, which also plays an important role in the climate system.

Agriculture, forestry and other land use-activities accounted for about 13% of CO₂, the IPCC report found. Some 44% of methane and 82% of nitrous oxide emissions from human activities globally during 2007-2016 represented 23% of total net human-caused emissions of GHG.

“Increasing impacts on land are projected under all future GHG emission scenarios,” the report warns. “Some regions will face higher risks, while some regions will face risks previously not anticipated.”

Response options throughout the food system, from production to consumption, including food loss and waste, can be deployed and scaled up to advance adaptation and mitigation.

All assessed modelled pathways that limit warming to 2.7°F or well below 3.5°F require land-based mitigation.

“Policies that operate across the food system, including those that reduce food loss and waste and influence dietary choices, enable more sustainable land-use management, enhanced food security and low emissions trajectories,” the report says.

The adoption of sustainable land management and poverty eradication can be helped by improving access to markets, securing land tenure, factoring environmental

costs into food, making payments for ecosystem services, and enhancing local and community collective action, the IPCC says.

Another food concern is how climate change is becoming a major threat to honey bees. Researchers say it is altering the scent of plants, and thus the capacity of bees to recognize them and orient themselves.

A bee remembers a fragrance and associates it with the resources provided by a given plant. Floral scent consists of hundreds of small molecules emitted by the plant. However, when a plant is stressed – due to a lack of water or because it has been attacked by herbivores – it responds by emitting defensive compounds that alter its scent.

Researchers also warn that warmer soil temperatures caused by climate change are expected to reduce soil moisture content in global ecosystems, resulting in higher crop productivity for wet regions but reduced productivity in dry regions.

Elsewhere, a new study debunks the theory that the burden of climate change will fall only on hot or poor nations.

Researchers from the UK’s University of Cambridge suggests virtually all countries will suffer economically by 2100 if the current trajectory of carbon emissions is maintained.

In fact, the research suggests that – on average – richer, colder countries would lose as much income to climate change as poorer nations.

For instance, under a business-as-usual emissions scenario, average global temperatures are projected to rise more than 7.2°F by the end of the century. This would cause the U.S. to lose 10.5% of its gross domestic product (GDP) by 2100.

Canada, which some claim will benefit economically from temperature increases, would lose more than 13%.

“Canada is warming up twice as fast as rest of the world,” study co-author Kamiar Mohaddes says. “There are risks to its physical infrastructure, coastal and northern communities, human health and wellness, ecosystems and fisheries – all of which has a cost.”

Mohaddes warns that 7% of global GDP is likely to vanish by the end of the century unless action is taken. Japan, India and New Zealand will lose 10%. Switzerland 12%, Russia 9% and the UK 4%.

Mohaddes says it isn’t just about the number on the thermometer, but the deviation of temperatures from their historical norms – the climate conditions to which countries are accustomed – that determines the size of income loss.

“Whether cold snaps or heat waves, droughts, floods or natural disasters, all deviations of climate conditions from their historical norms have adverse economic effects,” he says.

One-time Republican presidential candidate Marco Rubio, a U.S. senator from Florida, says his state will be forced to continue making adjustments.

“Trend lines suggest sunny day flooding will become increasingly common as local sea levels rise from a variety of causes,” he writes in *USA Today*. “As a result, some researchers predict that the 30-year mortgage will die out in low-lying parts of our state.”

Sunny day flooding – sometimes referred to as high tide flooding – is the term the National Oceanic and

Atmospheric Administration (NOAA) uses to describe shoreline flooding that is not the result of a storm or some other weather event.

“Sea-level rise flooding is what it is,” says NOAA oceanographer Billy Sweet. “It’s front and center,” he asserts declaring this is not an end-of-the-century problem.

“If water is bubbling up through your streets, you’ve waited too long,” he warns.

Indeed, NOAA records show Boston suffered 19 days of flooding in 2018, a more than a 200% increase from 2000. Baltimore and Annapolis each broke records with 12 days and Cambridge totaled seven. Washington, D.C. saw a record 22 days of flooding.

From May 2019 to April 2020, NOAA’s predicts that high-tide flooding will occur about twice as often as it did in 2000. By 2030 and 2050, some locations could flood as many as 175 days a year.

Property values already are declining in the most-affected locations. Flooding rivers, meanwhile, which to date have caused damage estimated at more than US\$100 billion a year, are set to get worse.

Vienna University of Technology flood expert Prof. Günter Blöschl, who led an international study involving 35 research groups, says the findings provide clear evidence that changes in the magnitude of flood events observed in recent decades can be attributed to climate change.

“Regardless of the necessary efforts of climate change mitigation, we will see the effects of these changes in the next decades,” he says. “Flood management must adapt to these new realities.”

Princeton University researchers make the same point. They predict coastal flooding for every county on the U.S. Eastern and Gulf Coasts. They also warn 100-year floods could become annual occurrences in New England and happen every one-to-30 years along the southeast Atlantic and Gulf of Mexico shorelines.

A 100-year flood now has a 1% chance of happening every year.

“The historical 100-year floods may change to one-year floods in northern coastal towns in the U.S.,” said Ning Lin, associate professor of civil and environmental engineering.

But Robert Kopp, director of the Rutgers University Institute of Earth, Ocean and Atmospheric Sciences, says trying to accommodate flooding with things such as infrastructure hardening, berms, flood proofing, building elevation, creating spaces that can be inundated, even floating cities, are all short-term solutions.

“If the average tide is higher, you will get more flooding,” Kopp says. “At some point high-tide flooding will turn into permanent flooding. Then it’s a matter of do you want to live with your house elevated above the water permanently?”

Economics Prof. Todd Pugatch of Oregon State University says in a study this year that tropical-storm-related deaths increase under most climate change scenarios by as much as 52%

Rubio says Americans, particularly Floridians, are right to be concerned about the changing climate.

“But they are also right to be concerned about a regressive overreaction,” he declares. “Plans stemming from panic will constrain our economy and cripple our

Canada is warming up twice as fast as the rest of the world.

ability to invest future resources in solving longer-term issues.”

Rubio says instead of restricting options for the next generations by borrowing against their future, “we should choose adaptive solutions deliberately, buy time and maximize the choices available to them in the decades and centuries to come.”

But scientists insist time is not on their side.

NOAA says that since the late 1800s, human-caused climate change has warmed the Earth’s average temperature by about 1.8° F. While extreme heat may not trigger the same visceral fear as a tornado, it causes nearly twice as many fatalities in the U.S. each year – more than any other weather hazard.

Indeed, a study by Tom Matthews, of the UK’s Loughborough University, reveals that once the wet-bulb temperature – where the air factoring in cooling as a result of evaporation – reaches 95°F, the body can no longer cool itself through evaporation of sweat, which can lead to heat stroke and death.

Extreme heat was rare 50 years ago in the U.S., but research by climate scientist James Hansen, former director of NASA’s Goddard Institute for Space Studies, shows extreme Summer heat now occurs about 7% of the time.

U.S. record highs have been outpacing record lows at a ratio of two to one, his study maintains. This difference could grow to 20:1 by mid-century and 50:1 by the end of the century.

In Europe, a heatwave in 2003 was estimated to have caused 70,000 deaths, and researchers found human influence at least doubled the risk of an event of that magnitude.

In 2010, another 56,000 people died in a heatwave in Russia, and researchers declare there is an 80% probability the excessive temperatures would not have occurred without global warming.

Most recently, the 2019 Summer saw two intense heatwaves in Europe just weeks apart and shattering records. Both were linked to human-caused climate change.

Modelling indicates the number of heatwave days may increase by four to 34 days a season for every 1.8°F of global warming. Some tropical regions could experience up to 120 extra heat-wave days a season if the Earth warms by 9°F, which could happen by 2100.

Equally as disconcerting, a recent study released by the Union of Concerned Scientists finds Dallas, Texas, predicts a few days above 105°F each year, but by 2050 this is expected to reach almost 30 days – and 60 or more by 2100.

University of Würzburg studies show higher mean

Then it’s a matter of do you want to live with your house elevated above the water permanently?

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Since the late 1800s human-caused climate change has warmed the Earth's average temperature by about 1.8°F.

temperatures can also have a severe impact on plants and animals by disrupting their relationship.

Beleaguered bees, for example, already under pressure from habitat loss and intensive agriculture, will see their delicate alliance with flowers suffer as the timing of plant flowering and bee hatching must coincide.

The pasque flower (*Pulsatilla vulgaris*), as one example, is extremely sensitive to rising temperatures, flowering earlier each year, whereas one of its major pollinators, a solitary bee species, can't keep pace by hatching earlier, reports researcher Sandra Kehrberger.

This may cause the plant's seed production to decrease and impair reproduction while requiring the bee to switch to other plants for its food supply, she says.

Another consequence of rising temperatures is forest fires that now rage Summer and Winter throughout the continents, from North and South America to Australia.

In Australia, the Seasonal Bushfire Outlook warns that the east coast of Queensland, New South Wales, Victoria and Tasmania, as well as parts of southern Western Australia and South Australia, face above normal fire potential.

It has been the fifth-driest start to the year on record, data shows, and the driest since 1970. The south experienced the driest January to July ever.

In Canada, boreal forests that have acted as carbon sinks for millennia are becoming sources of atmospheric carbon, potentially contributing to the greenhouse effect.

Prof. Merritt Turetsky of the University of Guelph, found a combustion of legacy carbon in nearly half of the samples taken from young forests less than 60 years old. This carbon escaped burning during the previous fire cycle but not during the record-setting 2014 fire season.

Yale University, meanwhile, reports climate change is also ratcheting environmental health threats including disease-carrying bugs expanding their range.

"Climate change is impacting our communities, in our backyards, right now," it quotes Amir Sapkota, a professor at the Maryland Institute for Applied Environmental Health, as saying.

Researchers at Princeton University predict that as global temperatures increase, heatwaves will become more frequent and the time between them will grow shorter.

Disease-carrying insects such as mosquitoes and ticks are expected to expand their range and activity, according to a

More than 70 major U.S. medical groups released a call to action this year declaring climate change a public health emergency.

"It's so important that people recognize that climate change is about our health," says Jonathan Patz, director of the Global Health Institute at the University of Wisconsin.

Pathways include heat, air pollution, extreme weather, vector-borne diseases, and access to safe water and food. Heat stroke and exhaustion are some of the heat-related illnesses that can include cardiovascular and kidney problems.

Without reductions in GHG emissions and atmospheric concentrations, climate change is also expected to make air quality worse.

"From your respiratory health such as asthma, to cardiovascular diseases, to mortality, you name it, air pollution affects so many different things," Sapkota says.

Disease-carrying insects such as mosquitoes and ticks are expected to expand their range and activity, according to a Canadian National Microbiology Laboratory report that says warmer Winters are likely to increase the number of ticks that survive and lengthen their active season.

Climate change is also expected to negatively affect crop yields with floods, droughts and storms wiping out agricultural fields. Warmer Summer temperatures may make growing some crops such as corn, more difficult. Elevated levels of carbon dioxide could reduce the nutritional value of wheat and rice.

European researchers say increased warming is also promoting the invasion of the honey bee pest, the small hive beetle (SHB).

The study by Wageningen University in Netherlands, the University of Bern, Switzerland and the Center for Environmental Research, Germany, found that under the current climate, the results show many areas globally not yet invaded by SHB are suitable for the pest, suggesting a considerable invasion risk.

"Future scenarios project a vehement increase in climatic suitability for SHB and corresponding potential for invasion," the study says. This is especially true in the temperate regions of the northern hemisphere, the researchers say in the study published in *Global Change Biology*.

"This is a clear case for global warming promoting biological invasion of a pest species with severe potential to harm important pollinator species globally," the report says. **BC**

Old Comb And Beeswax

David MacFawn

Old Comb can be processed in a solar wax melter, a double-boiler, or a “crock-pot” type of melter. Each melter has its benefits and detriments, costs, and time constraints. Beeswax has a melting point of 144° to 147°F (62° to 64°C) and a flashpoint of 400°F (204.4°C). If the beeswax is heated above 185°F (85°C) discoloration occurs. When processing beeswax, care should be taken that it does not get on other surfaces; beeswax is difficult to remove.

Old frames with an old comb can be reprocessed to collect and render the beeswax. Frames with all beeswax foundation with an old comb can be placed in a solar wax melter to render out the beeswax. Frames with the plastic foundation can be scraped, brushed, and reused, with the scraped beeswax placed in a solar wax melter. The plastic foundation can then be re-waxed and the frame reused. Care should be taken such that the plastic foundation does not transmit American Foul Brood. While capping wax will be light and have a high yield, beeswax from dark comb will have a lower yield (have a lot of slumgum or debris from raising brood) and typically is very yellow or orange.

A solar wax melter is good for melting beeswax comb and burr comb. It uses the sun as a heating agent. The beeswax is placed in the solar wax melter, the melter is placed in the sun and left alone for a day or so, or until the wax is melted. Debris in the comb stays on the melter tray and the melted beeswax drains into a collection pan. Very little effort and attention are required to melt the

wax. Sometimes the beeswax may need to be processed twice to remove all the debris.

The Betterbee Solar Wax Melter has a baffle to keep debris from falling into the melted wax pan. It works very well but does not have the insulating wall capacity a wooden wax melter does. The Betterbee Solar Wax Melter is a lot lighter and easier to lift and move than a wooden wax melter.

Consideration should be made to paint the inside of a wood solar wax melter black to increase the temperature inside. A solar wax melter will cost anywhere from \$120 and up.

Some beekeepers are now using “Crock Pots” to melt small amounts of wax. Mann Lake has figured out a way to drain processed wax out of their 10-pound wax melter with a dispensing valve. This 10-pound wax melter works well for small amounts of wax with little attention and costs around \$60 to \$70. The 10-pound wax melter processes wax quicker than a solar wax melter.

I bought a 10-pound wax melter and tried it. Wax and debris clogging the spout and valve were a concern. I placed the wax to be melted in a cotton cloth so no large debris pieces could get into the valve and placed the cloth in the wax melter. The valve did not clog. The melter was turned off and left to cool overnight to see if the spout and valve would heat enough the next day to melt the hardened wax and unclog. It did heat up enough to unclog the hardened wax in the spout. The cloth I used was a “loose” weave cotton cloth. An old cotton T-shirt would probably work better at not allowing fine debris particles to pass through the cloth. The Mann Lake 10-pound wax melter is a viable alternative for the beekeeper who keeps a small number of hives.

The 10-pound wax melter would also be an excellent melter to heat wax for candles. The wax can be dispensed directly from the spout into the candle molds. I have tremors in my hands and this is an excellent alternative to the wax candle pouring pots.

The beeswax can also be placed in a large pot of boiling water, or a large double boiler (for large amounts



Betterbee Solar Wax Melter
(photo courtesy Betterbee)



Dadant Solar Wax Melter
(photo courtesy of Dadant)



Crock pot and double boiler - Amazon.



of wax), but requires more diligence and care to melt the beeswax than a solar wax melter. A double boiler is a smaller pan fitting into a larger pan with water in the larger pan. The water in the larger pot will heat the wax in the smaller top pan and the wax will attain the wax's melting point. The water in the lower larger pan will keep the wax from attaining its flashpoint. The slumgum (debris) from dark comb will fall to the bottom and the wax will float to the top. Some water can be placed in the top smaller pan to allow a greater distance between the debris and wax on the top. Debris can be scooped out of the top pot if needed. Once cooled, the wax can be removed from the top.

With small amounts of wax, the beeswax to be rendered can be placed in several layers of cheesecloth, tied, and the cheesecloth bundle placed in the top pot of a double boiler. When rendering beeswax be extra careful that the beeswax does not reach its flash point and catch something on fire. As long as the water is in the bottom pot of the double boiler, you will be safe.

A plastic foundation can be re-waxed with a

paintbrush dipped in melted beeswax. Both sides of the frame/foundation should be re-waxed. For a larger number of frames, wax can be melted in a double boiler, water placed in both pots, the wax melted in the top pot, and the brushed clean plastic frames dipped into the wax in the top pot. The depth of the water and amount of wax in the top pot will determine the wax coat thickness on the plastic foundation. The bees use this wax coating to draw out the beeswax comb.

Equipment used to process beeswax should not be used for other cooking, since the beeswax is difficult to remove. Also, care should be taken where you process the beeswax since it gets all over everything. A separate hotplate/burner works well in a shop environment.

Drawn comb is "golden." It takes about 8.4 pounds of honey to draw out a pound of beeswax. By saving and reusing your old comb, your honey production can be increased significantly. A comb that the queen has laid in and is dark can be stored with PDB (Para-Dichlorobenzene) crystals (don't use anything with Naphthalene in it), or frozen in a freezer. Wax moths will consume the dark comb if it is left out in hot weather. The wax moths will leave the white wax honey super comb alone and it can be stored in the honey supers. Once all the debris is removed from the beeswax and it is formed into cakes, it is very stable and lasts a long time.

Beeswax is valuable and can be sold or reused to recoat plastic frames; it is used to make candles or cosmetics, salves, and lotions. There are several methods to process old beeswax. The solar wax melter has been around a while and requires very little attention. The 10-pound wax melter works well and is a true leading-edge innovation. A double boiler configuration requires the most attention. It is worth the money to purchase the correct equipment to process and reclaim old beeswax. Take care that beeswax does not get on unwanted surfaces and does not overheat. Processing beeswax in a shop environment should be considered. **BC**

David MacFawn is an Eastern Apiculture Society Master Beekeeper and a North Carolina Master Craftsman beekeeper living in the Columbia, South Carolina, area. He is the author of two books, <https://outskirtspress.com/>

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HUBER'S NEW OBSERVATIONS UPON BEES

BICENTENNIAL EDITION 1814-2014

BY FRANCIS HUBER
TRANSLATED BY C.P. DADANT

CALENDAR

◆FLORIDA◆

Spring Bee College will be held March 6-7 at UF/IFAS Honey Bee Research and Extension Lab, Gainesville.

For more information visit <https://entnemdept.ifas.ufl.edu/honey-bee/extension/bee-college/>.

◆GEORGIA◆

Lake Country Beekeepers Association 8th Annual Short Course will be held January 25 at the Greensboro United Methodist Church..

Speakers include Bob Binnie, Rick Coor, Keith and Rose Anne Fielder.

For information visit LCBA2020.eventbrite.com or contact lakecountrybees@gmail.com.

◆ILLINOIS◆

University of IL Bees and Beekeeping Short Course will be held April 18 at the Bee Research Facility and the Carl R. Woese Institute for Genomic Biology.

The cost is \$100. Must bring your own protective gear. Course is limited to 50 participants.

For more information and to register email cundiff@illinois.edu or 217.265.7614.

◆INDIANA◆

2020 IN Bee School XVIII will be held February 29 at Decatur Central High School.

Marla Spivak will be the keynote speaker. Program runs from 8:30 to 5:00

For more information visit https://indianabeekeeper.com/events/indiana_bee_school_xviii.

◆IOWA◆

CIBA Winter Seminar will be held January 18 at Grimes Community Center in Grimes. The cost is \$35/members and \$40/non-members which includes lunch.

Featured speakers are Larry Connor, Judy Wu-Smart and Sheldon Brummel.

For more information visit <https://centraliowabeekeepersassoc.org>.

◆MISSOURI◆

Eastern Missouri Beekeepers Association 13th Annual Beekeeping Workshop will be held February 7-8 in St. Louis.

Keynote speakers include Jennifer Berry, Kim Flottum, Gary Reuter, Becky Masterman, Bridget mendel Lee and Ana Heuk.

The cost is \$85/person, \$95 after January 19. Banquet costs is \$30/person.

For more information visit www.easternmobeekers.com.

◆OHIO◆

Warren County Beekeepers and OH State Beekeepers Association will hold their annual Beginning Beekeeping class January 25.

For information visit warrencountybeekeepers.org/.

◆TEXAS◆

Austin 9th Annual Beekeeping Seminar will be held January 4, 202 at the Marriott, La Frontera, 2600 La Frontera Blvd., Round Rock.

The cost is \$75/person.

Featured speakers include Juliana Rangel, Blake Shook, Mary Reed, mark Hedley and many more.

For information contact Lance Wilson lance@beekeepinghelp.com.

◆WEST VIRGINIA◆

The Mid Ohio Valley Beekeepers' Association will hold their Honey Bee Expo January 25 on the campus of WV University, Parkersburg.

The cost is \$20/person by January 6, at the door \$25. .

Featured speaker is Jim Tew.

For information visit www.movba.org.

◆WYOMING◆

Wyoming Bee College will be held March 21-22 in Cheyenne, with a Pre-Conference Workshop held March 20.

The cost of the workshop is \$125/person. The cost for the conference is \$85/person or you can do both for \$195.

Featured speakers are Phil Craft, Jamie Ellis, Scott Debnam, Reyah Carlson and more.

For information visit www.wyomingbeecollege.org.



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Marilyn and I are such country bumpkins. At the Apimondia bee conference in Montreal in September, jet-lagged and complaining of aches and pains, Marilyn spotted a “Massage” sign on a building down the street from our airbnb. It advertised aroma therapy, manicures, foot massage.

So she walked in. On the third floor, upstairs from the dental office, a sign pointed her down a bright pink hallway. “Weird,” Marilyn mused. Then suddenly a woman popped her head out of a doorway. “You’re in the wrong place!” she warned.

On the Montreal subway, fresh-faced young Canadians offered their seats to this aging beekeeper. At first I demurred, until the wise Marilyn explained that when someone offers you a kindness, you should graciously accept. Once when we got onto a crowded bus, a woman stood up as I approached. I thought she was getting off, and I gave her vacant seat to Marilyn.

But the woman stayed on the bus. Standing next to her, I tapped her shoulder. “Oh, I get it now!” I confided. “You offered me your seat, because I’m an old man, and I gave it to Marilyn, because she’s my gal. So now we’re both standing, and Marilyn has your seat!” We all three found this amusing.

The keynote of all keynote speakers at Apimondia was America’s own Tom Seeley. Gentle Dr. Seeley’s remarkable research into wild survivor hives in New York’s Arnot Forest is the stuff of scientific legend. Feral bees nesting in isolated, pollen-diverse locations, in small, widely-spaced, propolis-lined cavities high up in trees can and will evolve to live with *Varroa* mites.

So far, so good. I hung on Seeley’s every word as he explained that if feral hives can make it on their own in the wild, managed Langstroth hives can too, as long as the beekeeper keeps them in a way that mimics conditions found by bees in the wild. He calls his ruthless live-and-let-die techniques “Darwinian beekeeping.”

So you confine the queen to a small brood nest, and the hive swarms – perhaps repeatedly – each time naturally halving its mite load. Beautiful!

Seeley advocates roughening the inner walls of the brood chamber to encourage propolis buildup, a natural antibiotic barrier to disease. To further mimic conditions in the wild, he advises that the beekeeper encourage drone production.

You might harvest a little honey from your constantly swarming colonies, if you placed a queen excluder between the single brood box and a shallow honey super.

Seeley explained that insulation is important for overwintering colonies. Feral bees choose cavities that are normally better insulated than our Langstroth wooden brood boxes. And they prefer small hive entrances. He contradicts the winter beekeeping maxim that you should give overwintering colonies an upper entrance that allows moist air to naturally flow up and out of the hive. Seeley argues that bees need this moisture. It doesn’t collect at the top of the hive and rain down on your winter bees. Rather, it flows down those propolis-lined inner sides of the hive body, collecting at the bottom, where it provides a water source for our little darlings.

Of course you never treat these hives for *Varroa*. Remember, you’re keeping these colonies in a relatively isolated location, where there would be minimal opportunities for horizontal transmission of *Varroa* from the collapse of neighboring hives. But if they can’t handle the mites, you simply let them die. It’s Darwinian beekeeping! No tears! Sink or swim, babies!

I walked away from the thunderous applause following his closing remarks thinking, “How can I make this work for me?” Surely I could sacrifice a few colonies from honey production, to save the

bees! But where? If only I could find my very own Arnot Forest . . .

At lunch Marilyn burst my bubble. Darwinian beekeeping “is like keeping a squirrel in a cage,” she proclaimed. “If you’re not going to get any honey, why would you bother putting bees in a box?” I immediately grasped her point. If your isolated location is conducive to bee survival, feral bees should be there already, in just the right numbers. Why not leave well enough alone? Why would you bring in your own bees to compete with them and introduce diseases and parasites? All this, for little or no honey!

I suppose it boils down to why we keep honey bees in the first place. These non-native creatures do so much good! But in a sense, aren’t managed hives just livestock that we nurture and feed and protect, to improve our crop yields and give us honey to eat? And if they contract diseases or parasites, isn’t it our responsibility as beekeepers to intervene on their behalf, just like we would for a sick dog or cow?

Don’t get me wrong. Tom Seeley’s Darwinian bees make my heart sing. They made it to the Golden Shore. Evolution needn’t take a million or even a thousand years. Right before our very eyes, survivor bees testify to the elegance of natural selection. I say God bless ‘em. But they’re not good honey producers. And the places where we need bees the most – our agricultural lands – are precisely the places Darwinian bees cannot survive.

Maybe you, too, dream of wild bees in the treetops, foraging where they will. But there’s no point putting them in boxes. We shouldn’t even try.

Ed Colby

Darwinian Beekeeping

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Gold Metal Lids Included



12 oz & 3 oz GLASS SKEP JARS

12 oz skep jars \$10.95/12 ct.
3 oz skep jars \$13.95/24 ct.
Gold Metal Lids Included

CLASSIC PLASTICS

8 oz - \$19.99/50 ct. Case
16 oz - \$23.99/50 ct. Case
32 oz - \$39.99/50 ct. Case
No Caps



DECO EMBOSSED JUGS

5 LB - \$82.95/72 ct. Case
3 LB - \$99.95/126 ct. Case
No Caps



MUTH JARS

4 oz - \$29.49/36 ct. Case
8 oz - \$13.40/12 ct. Case
16 oz - \$18.45/12 ct. Case
includes corks



PLASTIC PANEL BEARS

2 oz Panel Bears \$229.95/800 ct. Case No Caps
6 oz Panel Bears \$184.95/660 ct. Case No Caps
8 oz Panel Bears \$144.95/525 ct. Case No Caps
12 oz Panel Bears \$114.95/400 ct. Case No Caps
16 oz Panel Bears \$78.92/200 ct. Case No Caps
24 oz Panel Bears \$89.50/195 ct. Case No Caps



CLASSIC GLASS JARS

8oz - \$14.50/24 ct. Case
16 oz - \$8.45/12 ct. Case
32 oz - \$12.95/12 ct. Case



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