Bee Culture

JULY 2003

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PUBLICATIONS
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Photo by Dave Green, taken with a Nikon Coolpix 990 and much patience. www.pollinator.com

Spreading the Good News. A worker honey bee bends down the tip of her abdoman and exposes her Nasonov gland, releasing the Nasonov pheromone. It is further dispensed when she fans her wings. The pheromone is used to attract nestmates home or to water sources. It aids lost or disoriented workers after a major colony event (think beekeepers here). It's also used during swarm cluster formation, and again to orient the flying cluster to its new home.

Bee Culture

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FEATURES

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Publisher – John Root

Editor – Kim Flottum, Ext. 3214, kim@BeeCulture.com

Production Coordinator – Kathy Summers, Ext. 3215, kathy@BeeCulture.com

Circulation & Advertising – Dawn Feagan, Ext. 3220, dawn@BeeCulture.com

Publications Sales – Jim Thompson, Ext. 3255, jim@BeeCulture.com

Contributors

Steve Sheppard Mark Winston • Clarence Collison
Ann Harman James E. Tew
Malcolm T. Sanford • Wyatt Mangum

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DEPARTMENTS & COLUMNS

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 330-725-5624
EMAIL: KIM@BEECULTURE.COM

MAILBOX

Feral Colonies Thrive

Several years ago I asked John Harbo, who with his associates was working for a solution to parasitic mites in bees, what progress was being made. The most significant thing he said was that the best hope lay in reestablishing feral bees. When we find these surviving without, of course, treatment of any kind, then we shall have strong evidence of resistant strains. Last January Tom Seeley had an article in this journal about eight bee trees he had located, some time ago, all of them still thriving in the Fall. This Spring, in early May, before there had been any reports of swarming in this area, he checked, and found six of these still flourishing. This is very strong evidence of resistant bees. If they were not resistant to *Varroa* then we could expect all would now be dead. Dr. Seeley's next step is to set some empty hives out there, containing only empty comb, to attract swarms. These he will be able to monitor year round, and we should soon know whether the bees in those woods, and, presumably, other feral colonies, have developed resistance. This seems to me to be about the best news of bees I have come across in a very long time.

Richard Taylor
Interlaken, NY

Hive Carrier

Lloyd Spear's article in the March 2003 Bee Culture showed a design for a hive carrier almost identical to the one that I have been using for over 20 years. However, mine has several differences apart from the size of the lugs to fit the British Modified National.

Perhaps the most important is the addition of a further hinge in the centre of the cross-piece; this enables you to fold the carrier for easy stowage.

I have also made the handles more comfortable by shaping them using a plane.

Finally, the lugs are offset from the central position for two reasons: in use, the person with the longer handles walks at the front and the extra length prevents the hive from catching their heels; it also shifts some of the weight to the person at the back. My wife takes the front!

The lugs can be engaged in any of the boxes and we usually find that, with a single brood hive, it is more comfortable to lift from the first super although over very rough ground it may be better to lift from the brood box to get more ground clearance.

Construction is from two 54" lengths and two 9" lengths of 2" x 1" together with three backflap hinges. The lugs are made from two 15" lengths of 2" x 1", with the ends cut at 45 degrees so that they fit into the handholds easily, screwed and glued to the side rails.

We have also moved hives weighing a good 150lb very easily.

Peter Edwards
Stratford-Upon-Avon, UK

Hive Carrier

Thanks To *Bee Culture*

I would like to thank the A. I. Root Company and the staff of *Bee Culture* Magazine for placing the full page announcement for the Digitization of the E.F Phillips Rare Beekeeping Book Collection (Feb. 2003). Now, as in E.F. Phillips' time, the A.I. Root Company has proven their commitment to beekeepers.

In 1925, E. R. Root, then President of the A. I Root Company, helped funnel important beekeeping works to Phillips who purchased them with the donations from beekeepers for deposition in the library (see "Beeman of Ithaca" Nov 2000). Interestingly, the original donation was only solicited from New York Beekeepers. However, the Ohio Beekeepers Association must have assisted greatly as prizes were established for beekeepers of this group who donated the most to this effort.

Beekeeper donations have provided endowments to help make this collection the largest in the world.

The advent of the World Wide Web provides an unmatched

Continued on Next Page

MAILBOX

opportunity for all beekeepers to view important volumes formally locked up for "preservation & security." Once we secure funding to mount a volume, estimated at $200/book, any beekeeper in any country who can access the web can view the original volume and text from an internet capable computer. I might add that EAS has offered to match donations to help get this project off the ground. It truly is a multi-faceted effort. More information can be found at www.easternapiculture.org/programs/

Mike Griggs, President
Finger Lakes Beekeepers Assn.

Cool Beekeepers

We jumped into the pool with our beesuits on. The we went and took off honey. Our clothes kept us cool while the temperature was 95° The bees did not bother us because we had no smell and were wet. We did this for three days and removed about two tons of honey.

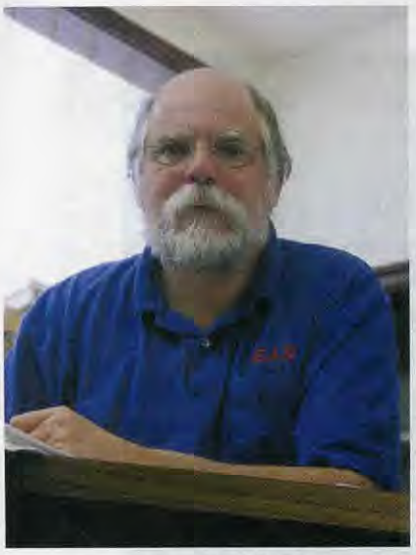
I got the idea while working construction – jump in about noon and work in cool clothes all afternoon.

Dick Crawford
Morrissonville, NY

Wilbanks Helps Out

I would like to thank The Wilbanks Apiaries, Inc. of Georgia, for helping me out with a bad situation. On April 19 I was working my beehives and found out that one of them had no queen. The bees were in distress and there was no brood. My other hives were too weak to help in giving brood to them. This hive had only about three pounds of bees coming out of a long hard Winter. I started calling different queen breeders but none wanted or could help me with **one queen**. They were too booked up or if they did send me a queen it would be about two to three weeks before they could start my order. I called about five different places and told them about my predicament. When I called The Wilbanks sales person, she also told me she is booked till June. I told her about my problem and these wonderful people went out of their way to help me with a queen. I received my queen within three days of calling them. Now this is how a company should be run. Once again thanks for helping a fellow beekeeper.

Dan Jermalovic
Mallory, NY



INNER COVER

Dear A. I. Root,

Well, it's July, and I recall your fondness for the fourth, and all the festivities that special day brings, and certainly the real meaning of this holiday, so I thought I'd touch base and fill you in on some of what's been going on since last I wrote, as well as wish you a happy and safe holiday. Much has happened since we last talked.

Right in our back yard this Spring, beehives have been stolen. Can you believe it? A pickup load disappeared early in May. What with the hard winter, and people making promises about spring pollination, I'm not surprised it hasn't happened more often. Out west, where there are lots and lots of beehives, beekeepers, orchards to pollinate and people who feel they can appropriate other people's property, this activity happens all the time. But here, in quiet and conservative Ohio it was a surprise. California, during the almond bloom this year, had more of this kind of problem than in recent memory. And you know how easy it is to just go out in the middle of the night and pick a few here and there. Well, they caught one of the thieves out there, but we're still looking here. Maybe you have a thought on where to look for them, or who could have done this. Your vantage point should help. Let us know if you see something, O.K.?

Our neighbors to the north, the Canadians, have been having some intense discussions on whether they should open their border to the U.S. so they can again accept honey bees from our producers. It's been quite a debate, and I hear heated arguments aren't uncommon. I'm sure they will resolve this, as most of the folks up there that we know seem to be fairly level headed. But, as you can guess, it seems some aren't, and common sense, greed and desperation clashed and common sense lost the battle. Someone up there decided that the rule that bees from the U.S. shouldn't cross the border (unless under their own power, I suppose) just didn't apply to them. In fact, from what I hear, this has happened several times this year. Only a couple of people have been apprehended by the Canadian Customs officials that I know of. In the most recent instance, over 8,000 queens, (worth about $100,000.00), were put in a horse trailer, but didn't escape the watchful eye of the border guards. The smugglers were hired by person or persons unknown at the moment, and the actual driver was led away in cuffs and is now spending time as a "guest of the Crown" as the phrase goes. Apparently, the authorities know who organized the activity, and who participated in rounding up the queens in our country. I don't know yet who was involved, but I imagine it will come out in the wash. That will be embarrassing. But almost as sad, there were no options for the authorities other than to quietly dispatch all those queens, and all the workers who were with them. What a shame.

This brings to bear though the difficult time Canada's beekeepers are having with obtaining quality stock in a timely manner at an affordable price. It also brings to bear the discussions going on up there. Who is right, do you suppose? Those who want to remain closed to U. S. bees, or those who don't? Recently, bees from Hawaii and New Zealand have been coming into Canada. The New Zealand bees have been rife with Varroa mites lately I hear, so that isn't working well. If you have some insight on resolving this dilemma don't hesitate to let us know. Time is short for solving this problem.

Well, can you believe this? In early June I got a call from a pretty good beekeeper up here in the northeast part of the country. He's a friend who's been keeping bees longer than I've been sitting in your old chair, so I have some faith in his judgment. He'd had a colony swarm, caught it and put it in a super with some drawn comb and foundation, and was going to save it for a friend who wanted to start keeping bees. He went back several days later, with his friend, to check on how the swarm was doing. He opened the box and pulled out one of the frames with drawn comb to look. His friend immediately spotted the queen. "Look" he said, "there's the queen. And there's one. And another. And another"

My friend looked, and sure enough, queen-like bees were laying eggs. In fact, lots of queen-like bees were laying eggs as he tells it. Maybe 20 on that frame. Wow! So he looked closer. Those queen-like bees weren't really queens at all. They were smaller, darker and, well, different. Then he looked closer at the colony. There were lots of dead bees in front of this colony. Many of them looked just like the queen-like bees that were laying eggs inside.

Like I said, he's a pretty good beekeeper, and this was something that had him absolutely completely stumped. But being a pretty smart guy, he immediately got a jar with some alcohol and scooped up a bunch of

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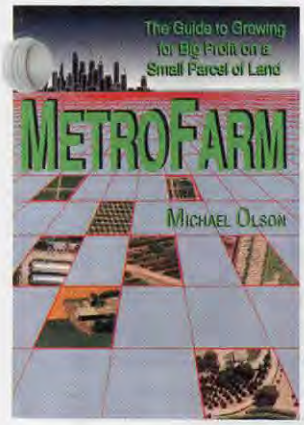
HERE'S WHATS NEW!



Metro farming, The Guide To Growing For Big Profit On A Small Parcel Of Land, by Michael Olson. Published by TS Books, P.O. Box 1244, Santa Cruz, CA 65061. ISBN – 1963787608. 498 pages, soft cover, black & white. www.metrofarm.com.

Although written 10 years ago I have just discovered this book, but it has carried itself well for that decade.

The premise of this book is that it is far more profitable and promising to farm, and to sell what you produce, in an area where there are lots of people than it is to produce in a place where there aren't. That's pretty much a no-brainer, but it applies exactly to keeping bees and selling honey, too.

There are four parts – Strategy, Production, Marketing and Conversations. The middle two are perfect, no matter what you produce. These chapters explore surveying the market, selecting crops, organizing a business, preparing for market and actually selling, plus many more.

Ownership, financing, book and record keeping, business plans, quality assurance, grading, selling and presentation all apply just as well to honey as sweet corn.

The last section deals with conversations with successful metro farmers – dealing with labor issues, market choices, expansion plans and the like transcend plants, and even bees.

If you are considering, seriously, making money in bees, this book is a good place to start.

Kim Flottum

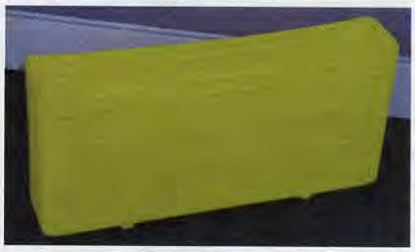
Candibox™

Candibox™ is the first reliable internal bee feeder system that avoids bee drowning, has over two gallons capacity, and it's virtually maintenance free. The secret of this revolutionary concept is the special shape of the **Candibox™** that allows *fitting the frames inside it.*

For a more efficient operation it is better to place the feeder in the same position on all the hives. For example: the far right side of the lower box in all hives. This way when it's refill time you already know where all the feeders are. You can leave the feeders inside the hive all year round, even if you do not fill them.

This simple and standard way will save you a lot of time on the refilling operation.

For more information contact NSI Company, Email: nsico@cosmoslink net; www.candibox.com or call 714.579.1911.



What Good Are Bugs? Insects in the Web of Life. Gilbert Waldbauer. Hard cover, 6"x9", 366 pgs. B&W. $29.95, ISBN 0674010272. Harvard University Press, 79 Garden Street, Cambridge, MA 02138, 617.496.1340.

Did you know that of 775 tropical plants used as food by humans, 88% are pollinated by insects, 5% by bats, 1% by birds, and 6% by the wind? That honey bees have a dance language that indicates the direction and distance to a patch of nectar flowers? That several species of orchids are pollinated by male wasps attracted to and even trying to copulate with flowers that look and smell like a female of their own species?

What Good Are Bugs? the first book to catalogue ecologically important insects by their roles, gives us a look at how insects work in ecosystems – what they do, how they live, and how they make life as we know it possible.

In *What Good Are Bugs?* Waldbauer combines anecdotes from entomological history with insights into the workings of the natural world, describing the amazing behavior of these creatures. He weaves a colorful, richly textured picture of beneficial insects on earth, from ants sowing "hanging gardens" on Amazonian shrubs and trees to the sacred scarab of Egypt burying balls of cattle dung full of undigested seeds, from the cactus-eating caterpillar.

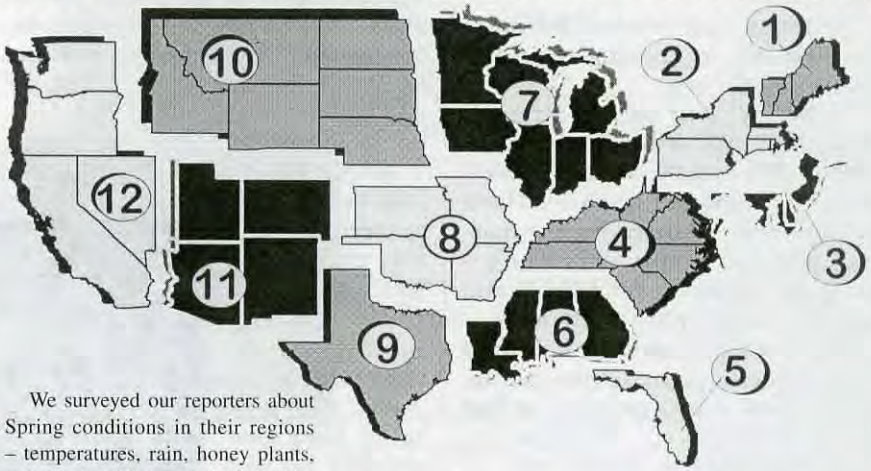
Land Use In The Upper Mississippi River Basin. New Strategies for Saving Open Space. Produced by the National Conference of State Legislators, written by Larry Morandi and L. Cheryl Runyon. 6" x 9", soft, 47 pgs. Color. $20 ISBN 1580242499; item #4354. 7700 E. First Pl., Denver, CO 80230, 303.364.7700.

If you're in the middle of dealing with a local or state government on how local land is going to be used, you will find useful, and practical ideas here that will benefit communities, people, honey bees and beekeepers.

Though the focus is on the Midwest area surrounding the upper Mississippi, the concepts used are universal. Governments are finding that unmanaged growth is costing much more than is gained. The urban-rural fringe possesses water shed areas, recreational and economic values, and productive potential other than big box stores and housing.

Conserving, and managing this land is becoming imperative. This book, with your input, will aide and assist those making these key decisions.

JULY – REGIONAL HONEY PRICE REPORT



We surveyed our reporters about Spring conditions in their regions – temperatures, rain, honey plants, colony conditions, and their take on what the future holds this season.

Overall, 37% report an increase in the demand for their honey, 52% report no change, and only 8% talk of problems due to higher prices.

Region 1

Prices steady for bulk, down for pails but up a bit for both wholesale and retail. Demand average to better. It's been cold and wet slowing both bees and plants. Predictions only modest.

Region 2

Bulk prices steady, pails up, wholesale steady but retail up. It's been cold and wet, plants and bees are slow and the season will be a toss up. Demand, though is strong.

Region 3

Bulk and pail prices steady, wholesale down but retail up. Cold, wet, plants and bees slow, and season the same. Demand only steady.

Region 4

Prices absolutely steady across the board since last month, and demand up to average. Cold, wet and slow to average build up for both bees and plants. Prediction for average season.

Region 5

Bulk, pail and wholesale prices up, while retail steady. Demand steady to increasing. Temps have been cool but not too wet, plants and bees about on schedule. Predictions a bit down for the season.

Region 6

Bulk and pail prices steady, wholesale up but retail prices steady. Right on average for rain, temp and bees and plants build up. Predictions optimistic. Demand right on average.

Region 7

Interestingly, bulk and retail prices up since last month, but pail and wholesale down a bit. Demand, though, strong to steady. Cool, wet weather has slowed plants and bees. Predictions mixed for the season.

Region 8

Bulk prices up a bit, but the rest steady as she goes. Demand, too is steady. Temp and rain dry to average, meaning plants and bees about where they should be. Optimistic predictions.

Region 9

Bulk and pail prices up, wholesale and retail steady. Demand strong to steady. Temps average to warm, wet though, so plants steady and bees doing O.K. Only average outlook for season.

Region 10

Prices steady across the board since last month. Demand still steady to strong. Temps average rain a bit short so plants and bees doing O.K. Optimism reigns through.

Region 11

Bulk and pail prices up, while wholesale and retail have dropped. Demand strong to very strong and optimism for the season high.

Region 12

Bulk prices down a bit, pails up, wholesale down but retail steady since last month. It's been cool and wet, slowing both plants and bees – mostly in the north. Demand average.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
55 gal. Light	1.36	1.59	1.36	1.25	1.48	1.48	1.49	1.46	1.36	1.50	1.25	1.25	1.25-1.59	1.40	1.36	0.89
55 gal. Amber	1.20	1.10	1.30	1.00	1.33	1.34	1.46	1.36	1.40	1.30	1.18	1.00	1.00-1.46	1.25	1.32	0.79
60# Light (retail)	76.00	102.94	76.63	83.25	90.00	105.00	88.65	91.00	110.00	84.50	107.50	76.63	76.00-110.00	91.01	93.55	79.44
60# Amber (retail)	62.75	93.19	69.06	81.50	88.00	95.50	77.71	88.33	98.33	80.00	102.50	90.00	62.75-102.50	85.57	84.96	73.55
Wholesale Case Lots																
1/2# 24's	40.08	33.78	29.57	30.75	29.57	28.00	28.21	29.57	29.57	35.76	24.00	38.00	24.00-48.00	32.24	45.25	29.00
1# 24's	58.02	47.66	48.00	47.38	48.56	54.00	47.42	56.96	48.00	61.49	45.98	58.00	35.98-68.00	51.79	54.93	43.08
2# 12's	53.47	43.49	41.19	47.15	41.19	41.00	42.55	52.50	46.50	57.84	45.00	57.00	41.00-57.84	47.41	49.38	41.98
12 oz. Plas. 24's	46.99	42.14	45.04	47.26	45.04	46.00	38.86	44.40	47.50	50.26	23.48	47.40	23.48-50.26	43.70	46.93	39.85
5# 6's	51.35	51.89	46.22	46.50	46.22	60.00	44.52	50.00	46.22	61.86	50.00	66.00	44.52-66.00	51.73	53.03	42.17
Quarts 12's (**NEW**)	47.00	72.12	55.17	60.64	55.17	76.67	51.64	67.09	63.00	82.50	50.25	84.00	47.00-92.40	64.60	71.71	
Pints 12's (**NEW**)	32.00	37.35	42.86	38.70	42.86	49.33	36.92	41.20	36.00	55.44	48.00	48.00	32.00-55.44	42.39	46.81	
Retail Honey Prices																
1/2#	2.39	2.31	2.60	2.33	1.89	2.10	2.18	2.42	2.60	2.14	2.84	2.89	1.89-2.89	2.39	2.28	2.09
12 oz. Plastic	2.75	2.84	3.31	2.73	3.10	2.63	2.69	3.36	3.25	3.10	3.15	2.90	2.63-3.36	2.98	2.94	2.56
1 lb. Glass	3.21	3.59	3.83	3.32	2.86	3.67	3.14	4.21	4.00	3.47	4.04	3.88	2.86-4.21	3.60	3.50	2.80
2 lb. Glass	6.15	5.40	5.78	5.65	6.25	5.00	5.20	5.98	5.63	6.43	5.41	6.43	5.00-6.43	5.77	5.80	4.49
Pint (**NEW**)	3.50	4.50	6.12	4.21	6.12	6.67	5.77	5.26	4.25	6.89	5.78	6.12	3.50-6.89	5.43	5.56	
Quart (**NEW**)	8.63	9.45	11.17	6.50	11.17	10.33	8.61	8.03	8.25	12.78	8.55	9.60	6.45-12.78	9.01	8.40	
5 lb. Glass	12.40	11.72	14.19	10.84	10.00	12.00	13.99	14.32	14.19	13.04	12.96	14.35	7.80-14.35	12.48	11.71	10.11
1# Cream	3.50	5.33	4.38	4.30	4.38	3.83	3.68	4.30	4.00	4.52	4.84	3.87	3.50-5.33	4.24	4.11	4.22
1# Comb	3.83	3.86	4.66	4.65	4.66	4.00	4.20	4.40	4.66	4.50	6.88	5.75	3.83-6.88	4.67	4.63	4.38
Ross Round	4.50	3.45	4.15	4.71	4.15	3.75	4.12	4.00	4.15	5.00	4.50	4.00	3.45-5.00	4.21	4.19	3.94
Wax (Light)	2.75	2.00	1.95	1.70	1.20	1.65	1.53	2.50	1.00	1.95	2.10	2.50	1.00-2.75	1.90	2.07	2.06
Wax (Dark)	1.92	1.75	1.67	1.53	1.10	1.67	1.16	2.15	1.03	1.81	2.05	2.00	1.10-2.00	1.68	1.66	1.47
Poll. Fee/Col.	34.06	41.33	32.18	38.20	30.00	40.00	41.56	39.00	20.00	32.18	57.00	36.00	20.00-57.00	36.79	39.10	35.54

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

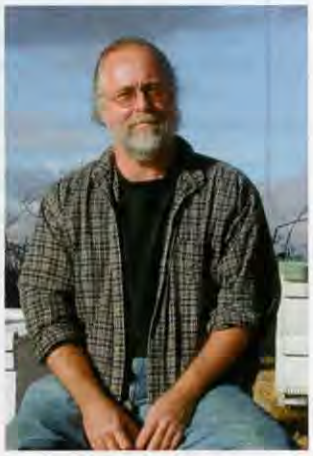
"Dance 'til you stop . . . not to exchange foraging information between individuals, but to communicate potential nest-site information."

Most beekeepers who read about the biology of honey bees are aware of at least a portion of the research contributions of Professor Karl von Frisch, winner of the 1973 Nobel Prize. His description of the honey bee dance language and the experiments he conducted to decipher the information communicated by the various dances captured the imagination of beekeepers and scientists alike. The notion that a returning forager can dance and communicate both the direction and distance of a floral resource to nest mates is beautiful in its apparent simplicity. While some researchers have disputed specific aspects of the dance language paradigm, the influence of Professor von Frisch remains evident in the questions that continue to be asked by scientists working in the field of honey bee communication. Our topic this month is a recent study of dancing bees (Seeley, 2003). However, the bees in this study perform dances not to exchange foraging information between individuals, but to communicate potential nest-site information for integration and use in decision-making by a swarm.

In his research paper, Dr. Tom Seeley of Cornell University first describes the process of swarming and the fact that once the swarm has settled as a cluster, scout bees leave and search the area for suitable nest sites. These scout bees return and perform waggle dances indicating the location of potential nest sites. Initially, the dances of the numerous scouts indicate a number of different possible nest sites. However, as time passes, virtually all the scouts begin to dance for one site and the swarm takes off and flies to this preferred site. Dr. Seeley points out that the mechanism whereby the scouts "achieve unanimity in their dances" is unknown. He suggests two hypotheses that could account for the behavior whereby scouts stop dancing for sites that are eventually not chosen (by the swarm). One hypothesis is that the scouts are influenced by the dances of other individuals. Thus, scouts dancing for the (eventually) chosen site may dance with greater vigor or in some other way influence the scouts dancing for less desirable sites. The other hypothesis is that scouts stop dancing for the less desirable sites without being influenced by other dancers. Thus, an internal mechanism within the bee may exist that reduces dancing for sites over time.

To test these hypotheses, the author set up a total of six artificial swarms (each containing approx. 7500 bees and a caged queen) and observed them from the time of swarm cluster set-up until the swarm departed for their new nest site. He marked the first four to eight scouts that performed dances on each swarm cluster. Prior studies had shown that such early dancers were likely to be scouts dancing for nest sites that (eventually) would not be chosen. The author recorded the activities of the marked scouts, including the duration and frequency of dances they performed, duration and frequency of all dances they followed, their departures and returns to the swarm cluster and whether a scout was active or inactive on the cluster. He also estimated the direction and distance of the proposed nest sites from the observed dances.

Overall, the author marked and observed 37 scout bees in the six artificial swarms. He found that 31 of the 37 scouts initially danced for sites that were not chosen by the swarm, confirming that the majority of early dancers in a swarm cluster dance for non-chosen sites. Most of these (21 of 31) stopped dancing before the swarm reached a decision. A small minority (6 of 31) switched and began dancing for the chosen site before swarm departure. Of the 21 scouts that stopped dancing before the swarm reached a decision, 18 stopped dancing for their non-chosen sites before they started following any other dances. Similarly, of the six scouts that switched and began dancing for the chosen-site, five had already stopped dancing for the non-chosen site before they started following dances Thus, the author concluded that the early scouts, who initially danced for non-chosen sites, ceased dancing on their own and not as a result of the influence of other dancers.



The data collected by the author on the pattern of departures and returns of individual scouts to the swarm cluster and on the duration of the dances themselves provided more insight into the process of dance cessation by scouts and nest-site selection by the swarm cluster. He found that the strength of the dances performed by scouts (measured by the number of waggle runs/ return to the swarm) declined with each consecutive return to the swarm cluster. The decline took place whether a scout had visited a

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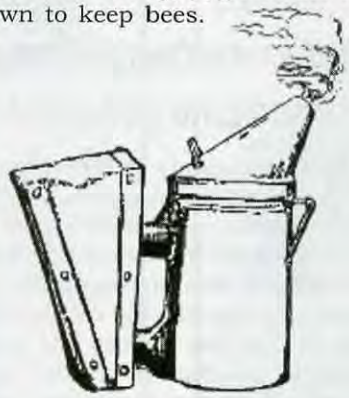
How Stuff REALLY Works # 27
The Bee Smoker

Bee smokers are required by federal law to use bellows, preserving jobs for the AFL-CIO buggy whip, bellows, & sandal makers local #273.

100% virgin Naugahyde bellows are a constant aggravation to the "Save The Nauga" foundation, who often picket beekeeper meetings.

Sizes of smokers range from seven inches to 12 inches. As this is a family publication, we cannot comment further.

Top pull-ring is small, but perfectly sized for the fingers (and noses) of the Zambian Pygmies who make them. Sadly, pygmies are not known to keep bees.



Bottom of smoker gets hot enough to ignite dry grass and leaves. Beekeepers often work in dry grass and leaves.

While tin smoker body expands when hot, Niconel "memory metal" top shrinks when heated to make opening and re-fueling nearly impossible.

1/4 Witworth hinge-pin acquired from Latvian Navy World War I surplus stocks. No equivalent replacement parts available anywhere.

Joint between top and body of smoker leaks smoke when even a single pine needle is caught in between.

Operation is simple load fuel chamber with combustible material (pine needles, burlap, cotton waste, cat hair) and light with a match or lighter.

Once the fire is going well, close the top, which cuts off air to the fire. For a brief period (one to two minutes) the fire will smolder, and smoke will issue forth.

Operating bellows forces air into the bottom of the fuel chamber at high velocity, blowing out any flame or glowing embers remaining.

Lack of plug or cap for spout forces beekeepers to collect wine bottle corks. Most other features of smoker drive beekeepers to drink, anyway.

RESEARCH ... Cont. From Pg. 13

site that was eventually chosen or not chosen. The author postulated that a behavioral "rule" based on internally influenced "dance fading," could account for the eventual success of the scouting process to enable a swarm to make a good choice. The rule is that scouts returning to the swarm cluster for the first time perform their dance with a strength that reflects the quality of the nest site. The strength of the dance effort then declines with each return of the scout to the swarm cluster. Overall, scouts that return from poor nest sites will cease dancing earlier and recruit fewer new scouts, while those that return from an excellent site will persist in dancing longer and be more likely to recruit a strong supporting force.

The research outlined here is an excellent example of how thoughtfully designed experiments can lead to deeper understanding of honey bee biology. The direct observation of bee behavior on a swarm cluster is an experimental design that is beautiful in its apparent simplicity – much like the dance language itself. BC

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Dr. W. Steve Sheppard, Thurber Chair, Department of Entomology, WA State University, Pullman WA 99164-6382, shepp@mail.wsu.edu; apis.wsu.edu

Mark Winston

Leaving On A Jet Plane

"I'd like to suggest to the polite young man from APHIS that continuing to import honey bees into North America is both unnecessary and unwise."

I have few natural talents, but there are two unusual gifts for which I have always been grateful. The first is an ability to fall asleep anywhere, any time, without hesitation, no matter what is going on around me, and then to wake up refreshed from my nap twenty minutes later. The second, a less important but still useful trait, is to be able to write anywhere, although that one is not nearly as rejuvenating.

Today I'm waiting for a flight at the Montreal, Quebec airport, and since I've already had my nap my second talent is kicking into play. It's a good place to write, laptop on the table, coffee by my side, and an hour until boarding with no distractions. And it's also the right place for this month's column, because I've been thinking about travel a lot lately, of the queen bee variety.

My queen bee travel focus actually began quite a few months ago, when I came across a polite release from APHIS (the Animal Health Inspection Service of the United States Department of Agriculture) telling me that APHIS "wishes to inform you that we have published a proposed revision to the Bee Regulations in the Federal Register for your review and comment."

I can imagine the polite young man, obviously well-raised by his parents, sitting down at his computer and with carefully chosen, inviting language asking for each of our opinions about importing honey bees into the United States from Australia and New Zealand. Would that we had responded with similar grace and manners, perhaps beginning our comments with something like "It was so kind of you to ask for my opinion, and I deeply appreciate the opportunity to contribute to the discussion of this most-important issue."

I fear our mannerly government servant was disappointed with the tone of comments he received, as courteous exchanges are not the signature aspect of our industry's interactions with government. I do not, however, wish to go on about manners, although I think all of us might benefit from saying please more often, and writing thank-you notes promptly and regularly.

No, sitting at an airport has brought on a different direction to my thinking, one that marvels at how easy it is to go from one place in the world to another. I wonder whether the ease with which we are able to move queen bees from country to country, and continent to continent, has obscured our judgment about whether this is actually a good thing.

Suppose, for example, that honey bees had never been imported from the old world to the new by European settlers. Would agriculture be as productive, or our environment in better shape, without the honey bee? Impossible to say, although if we removed honey bees from agriculture overnight, production of many fruit, berry, oilseed, vegetable, nut, and a few other crops would diminish dramatically or even cease.

Not only honey bees, but also most of our crops, are foreign, and we could ask whether their introduction has been a benefit or detriment to North American ecosystems. Again, only idle speculation is possible, but I think it's a fair comment that agriculture has benefited and our environment has suffered from the introduction of foreign organisms. Our vast acreages of corn, wheat, soybeans, and other crops certainly help to feed us and the world, but have left our more natural ecosystems in sorry shape.

These are speculative musings, since we can not undo past introductions. We can, however, ask whether continuing to move honey bees around the world is a good thing.

Arguments for importing bees today primarily involve bringing in new stock with improved disease and pest resistance, which is ironic because most parasites and diseases of honey bees arrived while accompanying previous importations of honey bees.

I'd like to suggest to the polite young man from APHIS that continuing to import honey bees into North America is both unnecessary and unwise.

For one thing, our own stocks are diverse enough that continued importation of genetic material is not needed. There is good bee stock elsewhere, but recent importations have not proven superior to what is already present in North America.

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"Having a narrow focus on breeding for one trait such as resistance to a particular pest or disease may result in a bee with that trait but without the complex suite of other North American-adapted characteristics that make for a good overall colony."

The Buckfast bee is a good example. Somewhat mongrelized versions of these bees have been here for some time, but more recently purer stock was imported into North America from England and Europe because of the Buckfast bees' reputed tracheal mite resistance. These importations were frequent during the late 1980's and into the 1990's when tracheal mites were the pest-of-the-moment. Elaborate and costly quarantine procedures were used to minimize the potential of unwanted pest problems escaping from the imported stock.

There is no question that these were and are good bees, better in some regions than others, but certainly resistant to tracheal mites. But, they do not appear to be more resistant or better honey producers than varieties of honey bees already here at that time. Indeed, many beekeepers were able to select lines of tracheal mite-resistant bees without resorting to importations, and non-imported varieties are in widespread use all across our continent today.

Other examples abound, including "*Varroa*-resistant" queens. The idea of going to Asia to seek *Varroa*-resistant bees seemed to make sense, or to Europe where *Varroa* arrived about 10 years before North America. Wild colonies of honey bees that survived *Varroa* infestations might contain resistant genes, and in theory could provide non-chemical control of this important pest.

Yet, after numerous and well-publicized importations of potentially good stock, none of these highly touted bees have proven superior to what was here already, and in most cases they have not been widely adopted by beekeepers. Much of the tolerance to *Varroa* is based on hygienic behavior, a quality easily selected for with current stock, and no unusually interesting or obviously superior traits have surfaced from these importations.

In addition, most bees bred from recently imported queens have not performed as well as those selected over many decades for their utility under North American conditions. Having a narrow focus on breeding for one trait such as resistance to a particular pest or disease may result in a bee with that trait but without the complex suite of other North American-adapted characteristics that make for a good overall colony.

Continued introductions also pose risks of moving new problems along with the proposed solutions. Some of the worry is about new disease and pest organisms, but there also is concern about varieties that might be resistant to miticides, antibiotics, or other control chemicals. Would you want to accidentally import terramycin-resistant American Foul Brood, or apistan/coumaphos resistant *Varroa*, along with your purportedly superior queen bees?

Another question we should be asking is what happened to old-fashioned bee management, and are we seeking magic-bullet solutions by importing queens when simple management of a disease/pest problem would do the job just as well?

Even Resistant American Foul Brood can be controlled by aggressive culling of frames and burning of hives, coupled with the use of already-selected hygienic stock. Low-technology solutions remain feasible for many of our problems, and often we're too quick to buy into the sexiest-sounding approaches when in-the-trench solutions might be as viable. If our egos require high-technology outcomes, perhaps we should focus more on comb radiation treatments for AFB rather than on genetic solutions from imported queens?

The debates about importations consume a huge amount of scientific, regulatory, and extension time, weeks and months that might be better-spent more directly on finding solutions and explaining current options to beekeepers. Most importations require some level of quarantine in the importing country and/or certification from the exporting country, focusing our scant apicultural resources on peripheral issues.

Ironically, world trade agreements are moving towards more fluid movement of bees and other commodities as our understanding of the negative impacts caused by importations is increasing. A host of recent books and reports have emerged demonstrating the ecological and economic damage caused by imported plants, insects, animals, and microbes, but these sources appear to be having little effect at balancing the trend towards globalized trade.

Our industry is small, with little influence in the global corridors of trade power, but we can at least make our own decisions about if and when to support the global movement of bees.

The risks are high, and the benefits seem few. Past honey bee introductions may have been economically positive although environmentally negative, but that's water under the bridge. Should we continue to move bees around the world?

I love to travel, but I think I'll leave my queen bees at home. BC

Mark Winston is a Professor at Simon Fraser University, Burnaby, B.C. Canada.

The Fate Of Bee Inspection In The U.S.

Malcolm T Sanford

"It is far easier to get rid of a bureaucracy than to try to re-establish one."

Bee inspection services have been public whipping boys in the United States ever since discovery of tracheal mites in 1984 when colonies were first "depopulated" in a futile effort to control the infestation. Introduction of *Varroa* in 1987 paralleled the tracheal mite experience in many respects, and the Africanized honey bee, another regulatory nightmare, has finally entered the country. Meanwhile, the old beekeeping problems, particularly American foulbrood, have not disappeared. All this puts regulators in a bind; there appears to be much more to regulate and in many cases, diminishing resources with which to carry out needed inspections. This also frustrates beekeepers, who have seen their profits suffer due to increased costs, in many cases caused by regulations.

The results of inconsistent rules have caused many in the beekeeping industry to re-examine the role of regulators. Dr. Richard Taylor, long-time writer for *Bee Culture*, asked the question, "Have inspection programs outlived their usefulness?" (July, 1991). He ends his piece by stating, "My own view is, and has for some time been, that mandatory inspection of apiaries is something whose time has long since come, and gone. American foulbrood is a manageable problem that can be left in the hands of beekeepers themselves. This is not going to eliminate American foulbrood, to be sure, but neither is anything else. It is not a proper area for government."

Dr. Taylor's comments concerning the historical reason for bee inspection (American foulbrood control), why it is no longer needed and the fact that such bureaucracies tend to have a life of their own are valid. Most professionals in the research and education establishment would agree with much of what he said.

Although technologies to control American foulbrood, *Varroa* and tracheal mites are in place, however, does not necessarily warrant eliminating inspection services around the nation. The old saying, "Don't throw the baby out with the bath water," applies. Although in some cases inspection agencies are viewed as abusive and having a life of their own, as stated by Dr. Taylor, this does not mean they cannot adapt their programs to aid the industry being regulated instead of damaging it. Inspection services, like most political entities, are not necessarily immune to pressure from the group being regulated. And there are many benefits that inspection services perform for the industry that are not often fully appreciated.

As a former extension worker, I have always thought of bee inspectors as my agents in the field, providing needed information to beekeepers, running the gamut from the one-colony beehaver to a seasoned migratory operator. I don't know how many times I've referred persons to inspectors for a wide range of services beyond simply inspecting colonies for potential problems. These have included collecting pesticide-killed bees for analysis, investigating stinging incidents and nuisance colonies, and participating in local beekeeper meetings and educational events. Without these helpers in the field, I would not have access to information on beekeeping around the state or statistics about the industry. Inspection services have also been involved in working with mosquito control agencies, power companies and property owners concerning honey bee issues.

Surveys by *Bee Culture* (May 1991 and again in 1999) would not have been possible without state inspection services. Research into bee problems also is promoted by inspection services and sometimes they are active participants in the process. The current menthol application technology was championed by the Nebraska inspection service.[1] The Florida Apiary Inspection Service has been a strong supporter of current *Varroa* mite and Africanized bee research at the University of Florida by providing colonies and labor in these efforts. It keeps a detailed web page showing everything from a map of local inspectors to Florida bee-

1Nebraska Apiary Law, World Wide Web site, accessed May 21, 2003 http://www.agr.state.ne.us/regulate/bpi/ent/actas.htm.

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keeping laws and downloadable forms for certification.[2] According to the website, "Florida apiary inspectors certify honey bees for movement intrastate, interstate, and internationally. Regulated pests and diseases include American foulbrood disease, *Varroa* mite, and unwanted races of honey bees. Inspectors collect and submit samples to the food lab for certification as Tupelo honey and certify honey for foreign export. There are more than 200,000 honey bee colonies in Florida apiaries."

In Florida, a program of post treatment inspection of bees is also designed to be able to detect resistance of *Varroa* to chemicals early, and in the process, save the industry long-run grief. This service also has given leadership to Section 18 labeling of coumaphos (CheckMite+®) and is now helping to provide similar assistance for a product containing the essential oil thymol.

There is an Apiary Inspectors of America (AIA) association through which inspectors around the country are able to communicate. Blane White, Minnesota's chief inspector maintains a web page for the association.[3] He lists most of the state contacts and also the provincial inspectors in Canada. This association meets regularly, sometimes in conjunction with other beekeeping groups, and is a resource for both constituents and regulators in general.

For a more recent example of the kinds of service inspection programs provide, consider the following from Jimmy Dunkley, Program Coordinator, Louisiana Department of Agriculture and Forestry (LDAF) Nursery & Apiary Programs:[4]

"For approximately three years we have had an established SHB presence in the greater New Orleans area (reported in four locations/one parish/Fall 2000). New Orleans area beekeepers are surveyed annually and the latest survey shows natural and man assisted movement (10 to 15 locations/four parishes/Fall 2002).

"In January 2003, one beetle was collected by a beekeeper in south central Louisiana. The area has yet to be surveyed but that will start this month. The beekeepers in the area will be checked at their honey houses and colonies will be checked in the late Summer and Fall. (Latest information is that the find is positive for SHB, and a survey and detection effort will start immediately).

"Louisiana has an Africanized honey bee (AHB) bait hive survey program. It has produced only one SHB infestation in the greater New Orleans area (38 traps in the four parish area). It was collected in early Summer 2002 near positive domestic colony detections (1/2 to one mile distance). None have been collected in AHB traps in other sites in Louisiana (LA/TX border, North to South 140 traps; south central LA 16 traps; Mississippi river North of New Orleans 40 traps).

"LDAF inspectors have checked 10 queen and/or package honey bee producers for SHB the last six years with no detections. Several migratory operations are also inspected annually. Inspectors have been asked to check 25% more colonies this Spring. No detections have been made to date.

"On March 10th I was notified by USDA-ARS personnel about an introduction of SHB at the Baton Rouge honey bee laboratory. Brood combs and bees were brought to the Baton Rouge research facility for tracheal mite research purposes by a beekeeper from Texas on March 4th. Lab personnel discovered SHB on brood combs from the colony on March 5th and immediately froze all bees and combs in the equipment.

"Upon notification the LDAF placed a 'Stop Order' prohibiting any movement of bees and beekeeping equipment from the main laboratory site and a site directly across from the lab, off Nicholson Drive. All colonies at the sites stop ordered were inspected by March 18th and no SHB were found.

"Partial releases of bees and equipment have taken place since LDAF involvement but only after inspection and risk assessment (queens and attendants, used supers with new foundation after inspection, used honey supers after being frozen, etc.). Additional inspections were made on May 14 15, 2003 and no additional SHB detections have been found. The USDA Bee Lab was released from 'Stop Order' on May 15th."

Here is some further information on that particular situation from Dr. Thomas Rinderer, Research Leader at the Baton Rouge, Louisiana Bee Breeding, Genetics and Physiology Research Unit.[5]

"Bees on comb came in. Beetles came also. We had a short period when beetles might have gotten into lab hives. We discovered the beetles and killed the colony. The state instituted a quarantine on the apiary site. They inspected twice, this week being the last. The quarantine is now lifted based on no detection. We operated under inspection and certification of material that had to leave the site. LDAF officials went out of their way to make sure we could still do what we needed to do and I am grateful for their efforts.

"Having a regulatory action that ends with a full clearance of 'no hive beetle' makes moving bees possible. The inspections were thorough and complete, removing any cloud of doubt about whether or not we are infesting other beekeepers. Also, since we do not want to be the source of other beekeepers' SHB we would have rather restructured what we do if we had been found to be generally infested. But now, we can move to states that would not otherwise accept us and may be able to do so for a long time to come. Indeed, the places we go may get SHB before we do.

"This is another example of good regulation serving the needs of the beekeeping industry. If there is anything to think about here, it is that good apiary regulation is very important to all of us over the long

2. Florida Bureau of Plant Inspection, Apiary, World Wide Web site, accessed May 21, 2003 http://doacs.state.fl.us/onestop/plt/apiaryinsp.html.
3. Apiary Inspectors of America, World Wide Web site, accessed May 21, 2003 http://www.mda.state.mn.us/ams/apiary/aiahome.htm.
4. Louisiana Department of Agriculture and Forestry, World Wide Web site, accessed May 21, 2003 http://www.ldaf.state.la.us/.
5. Louisiana Bee Breeding, Genetics and Physiology Research Unit, Agricultural Research Service, World Wide Web site, accessed May 21, 2003 http://nps.ars.usda.gov/locations/locations.htm?modecode=64-13-30-00.

term. The payoffs of moving bees and queens without spreading problems is well worth the price of the short-term inconveniences of being regulated."

The inspection service is a vital bureaucracy, which can be used to hammer at the doors of an increasingly urban officialdom about the problems our industry faces. And it is not a given that some of the same concerns prompting establishment of bee inspection services in the first place, and well supported by the beekeeping industry in the past, will not reappear in the future. It is far easier to get rid of a bureaucracy than to try to re-establish one; beekeepers who support the dismantling of bee inspection services do so at the peril of losing a strong ally in their efforts to survive in a society less and less in touch with its agricultural roots. BC

Dr. Sanford is a former Extension Specialist in apiculture at the University of FL. He publishes the APIS newsletter: apis.shorturl.com

James E Tew

Bee Culture's Beeyard

It's Mainly About The Sting

I don't know how much interest you have in this, but once a year I take a short fishing trip to Canada with several friends. I've done this for years and have written numerous articles from this very cabin. In fact, many years ago, we kept about 30 beehives near here, but they came to an untimely end due to bear predation – an episode that's already been told in *Bee Culture*. Sitting on this lakeshore is a good place to reflect, fiddle around with fishing, and write about bees.

The Sinister Bee Box

A co-worker of mine needed a small nucleus hive for a research project on which he was working. I provided it for him and gave him instructions on moving and manipulating it. He put it near an Ohio State University building that was convenient to his office. A day later, I got a call that university police had been called to inspect a strange looking box that had mysteriously been put near the back entrance to the entomology building. They had responded to the call with apprehension and determined that it was not a terrorist's device, but just a small, innocent bee hive. If it had not been so disconcerting, it could have been funny. Well, unfortunately, to some people (maybe even many people) beehives are frightening and can see a beehive as a kind of terrorist's device.

I don't know the psychology

I've talked about this before, but the issue doesn't go away. Most people are extraordinarily afraid of bee stings in much the same way that they are instinctually fearful of bear attacks, shark attacks, or being struck by lightening. Yet, they will routinely drive a car at speeds that the human body will never, never, be able to naturally achieve.

In my job, I frequently interact with people who come to me for information that is sometimes contrary to beekeeping's good. For instance, I was recently contacted by a woman who said that she and her neighbors had small children and lived next door to a beekeeper. She said that she had checked into the situation and had found that there were no ordinances or restrictions against keeping bees in her neighborhood. She asked what she could do about this situation that was dangerous to children in the community. I knew...I knew...I knew that my chances were slim, but for the sake of beekeeping, I gave her the party line about the goodness of bees and the unlikeness that she would ever have problems. I pointed out that stinging insects were common and that just having this beekeeper move his yard would not be an end-all for her fears. Bright and early the next morning, I had a message, this time from the husband, tersely asking for the address of our state apiarist. Clearly, I had not given his wife the support she wanted and I assumed they were planning to explore the possibility that the beekeeper's hives were not properly registered. Maybe I'm being too sensitive, but I sense that they were seeing this as a threatening situation clearly in need of change. I would actually be surprised if they are not at the next city council meeting bringing up the need for restrictions against beekeeping in that particular city.

The Urbanization of Beekeeping

Honestly, I don't know any more about the effects of the urbanization of beekeeping than most of you. When beekeeping was more agriculturally related, there were fewer problems. People had livestock and lived closer to nature. Now, beehives are frequently kept very close to people who themselves are not beekeepers, who have never been responsible for any animal husbandry and who have no concept of the true issues of keeping non-pet-type animals. I and my neighbors are in this category. I keep two hives of bees in my backyard and must admit that I feel threatened at times – just by being a beekeeper and doing what beekeepers normally do. Neighbor closeness sometimes generates friction. I'd like to tell you that it's never the beekeeper's fault, but all too often the beekeeper has successfully made a bad situation worse by antagonizing fearful neighbors. I'm struggling here. What if I lived next door to someone who le-

gally had an animal like a bobcat, poisonous snake or an alligator? I suspect I could easily be uneasy and would wonder what kind of expertise the peculiar neighbor had. Most people tend to fear what they don't understand.

My neighbors

I have good neighbors with whom I have a decent neighborly relationship. They have asked the usual questions and I have given the usual answers. I have not been pushy or assertive and have tried to be sensitive to their concerns – but this is my situation. People are different and your relationship may not be the same with your neighbors. I suppose to some of you, I am copping out, but I try to do the following. What I am reporting is nothing new, but for those of you who have fearful neighbors, I hope that my observations help.

I work my bees at discreet times

Sad but true. If I can arrange it, I work my bees when my neighbors are at work or are away. It just makes my life easier. These neighbors are not going to become beekeepers and all I am trying to do is to keep them from complaining about my bees. If there is something I need to do, I do it, but if the time can be arranged, I hold off until I have privacy to be with my bees.

I put my hives in discreet places

In my case, discreet is not very discreet at all. It is the best place I have. It shields my bees from one of my neighbors, but from the other side of my yard, my hives are in plain view. For the present, there is nothing I can do, but I plan to put in a garden and a hedgerow (of some plant as of yet unselected), that will shield my bees from all my neighbors. Sad but true, but in general, I try to hide my hives. I know that some of you are offended by me doing this – I am not doing anything wrong – but it just makes my life easier at my small home apiary.

I keep discreet numbers of hives at my home yard

My home is on a one-acre plot in a plastic-type community. Before it was my home, it was a flat pasture. I am surrounded by neighbors who also have a one-acre plot – narrow, long and rectangular. Thankfully, behind my home is a soybean field. The farmer has never complained about my bees.

At any one time, I keep two hives and maybe two more for swarms or splits. I never keep more than four hives and as quickly as possible I cut back to two colonies. I have several other yards that I can move colonies to so there is no reason to stack colonies up at home.

I don't mean for this to be advice, but rather just a discussion of what I do – I keep only two (no more than four) hives in my yard. Your situation is probably different from mine. Do what seems logical.

I try to control swarming

Note that I said, *"I **TRY** to control swarming."* Sometimes they go and I can't do much about it. When they go, they never seem to hang in my yard, but always head straight for my neighbor's yard. Why is that? Out of seven or eight swarms, I have had only one that stayed in my yard. Then there is the feeling of incompetence when I get the call that, *"Jim, your bees are out."* Then I stroll across our back lawns with some improvised equipment in hand...expecting to answer the usual questions *(Are they making honey now? Do you ever get stung? Is the queen with the swarm?).* Several times I have not been able to get the swarm due to height. I feel terrible at those times. I am the bee man, I should know all the answers, and I can't do anything. I look like a dork.

My primary way to control swarming is requeening and splitting. I should requeen more, but splitting – hard splitting – usually stops things from progressing to swarming. But by splitting, I essentially destroy my honey crop. That actually depends on the year, but in general, (sad but true) splitting hives so harshly requires that I essentially lose any honey crop from my home yard. There must be a better way.

I try to be agreeable in other ways

I planted a grapevine in my yard that unintentionally blocked one of my neighbors from accessing the back of her yard. I had thought that it would be a good privacy fence, but I never thought about restricting my neighbor's access to the back of her yard. In a friendly way she asked if I was offended by her driving on my property to get to her backyard. She only does this about once per year and I certainly didn't care. I told her I would move it and I did. Late this past Winter, I moved the grapevine to another place. I hope she noticed. In the long run, it may not matter but I do try to be a good neighbor in most ways .... Hoping that when the time comes, they will be tolerant of me as I have been tolerant of them.

My neighbor's view of my hives.

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BEEYARD ... Cont. From Pg. 23

I don't bother.....

Generally, I don't bother giving honey on regular basis – actually hardly ever. I suppose I should, but I suspect my neighboring friends primarily eat corn syrup and my honey would only be wasted (remember, I don't get that much from my home yard anyway).

I rarely give lectures about how much better their garden will be or how important honey bees are to society. I thoroughly answer their questions, I try to get my swarms, and I try to change the subject to something about their kids or to how fast our lawns are growing.

I know, I know....

I know. It's a cop out. I should be more open and demanding in defense of my bees. Well, maybe I have not asserted myself enough, but I have been able to keep beehives on my property for about 20 years without serious incident. So far, it has worked for me. Until my neighbors change, I suppose I will continue to cop out. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu, www2.oardc.ohio-state.edu/agnic/bee/; www2.oardc.ohio-state.edu/beelab/

It's Raining

But things aren't always what they seem

James Fischer

Its raining as I type this.
Its Saturday morning.
Its supposed to be an apiary day.
Its pouring.
Again.
It happens a lot.

But how often? A quick internet search for "weekend rain" yielded many references to a paper I did not notice in 1998[1]. The paper, printed in the very prestigious science journal *Nature* and written by two Arizona State University climatologists, concluded that rain IS more likely to occur along the U.S. Atlantic coast on the weekend[2].

Their theory was that air pollution, which is well-known to follow a weekly cycle of increasing during the work-week, and then dropping off on weekends, was "seeding" the clouds, and causing the more-frequent weekend rain.

"When observing bee populations, nectar plants, or rainy days, 'Seasonal Cycles' must be considered in the data."

I live in the eastern U.S., but I had never heard anything about this. How could a story this "big" not have been mentioned by every weather reporter in the country? The journal *Nature* is a respectable peer-reviewed scientific publication, not prone to printing unsupported conclusions or ambiguous data.

Is hobby beekeeping doomed to suffer, forcing beekeepers to rush from job to apiary on weekday evenings? What about baseball games? Should I sell my bicycle now, before everyone finds out about this?

A brisk ransacking of several precarious stacks of magazines and journals that I keep telling my wife that I plan on reading "real soon now"[3] produced the August 6th, 1998 issue of *Nature*.

The paper looked legitimate. The data looked good. They looked at 30 years of records, which is a lot of weeks. It started to look like I needed to rig up a combination bee veil and umbrella, or start forgetting about spending quiet weekend mornings with the bees, and work my hives on Tuesday through Thursday.

The paper presented three different sets of data – daily carbon monoxide and ozone measurements from an island off the coast of Nova Scotia, daily satellite data for rainfall over the Atlantic Ocean, and hurricane data. In all three cases, the data, when sorted by day of the week, showed marked differences between weekends and weekdays.

It was a clear seven-day cycle.

While annual weather cycles are the expected results of seasonal change, weekly cycles could only be the result of human impact. Only humans follow a cycle of activity based upon the concept of "weeks."

"The weekly cycle is man-made," said one of the paper's authors in an interview with *Discover* Magazine. "It has no counterpart in nature. Heat-absorbing pollutant particles could warm surrounding air, driving it upward to create more clouds and rain. Pollutants could also increase rainfall at the edges of a hurricane, preventing heat from concentrating in the center and thus weakening the storm. These are some of the biggest storms on the planet, and the idea that we're affecting them is a little bit frightening."

How had this escaped notice? I sat down at a keyboard (It was raining, remember? My only other option was to clean the garage.) and logged onto a citation database, which tracks which scientific papers are referred to by other scientific papers.

This is a fairly good "sanity check," since a good paper, like a good judicial ruling, is cited more often than a lousy one.

One title jumped off the computer screen at me – "The Warmest Day of Any Week Tends to Occur on the

Continued on Next Page

1 http://www.nature.com/nsu/980813/980813-2.html Nature Science Update - "Another wet weekend" Aug 11, 1998

2 Randall S. Cerveny and Robert Balling Jr., 1998: "Weekly cycles of air pollutants, precipitation and tropical cyclones in the coastal NW Atlantic region" Nature: 394, 561 - 563

3 Science does not explain why my wife tolerates this, but neither does it explain why she tolerates me.

First or Last Day of That Week."[4] Kevin J. Coakley, who works in the Statistical Engineering Division of the National Institute of Standards and Technology, wrote a paper with a title that seemed to have gone even further, finding a weekly cycle of temperature variation! How had I also missed this? How had everyone I know missed it? As luck would have it, the full text of the paper was available online...

...but the paper explained that Coakley's findings were the same regardless of which day he picked as the "first day" of the week! Don't turn the page, keep reading, this DOES have bearing on beekeeping. It has bearing on any scientific work that deals with "trend" data like growth of populations of bees or *Varroa* mites.

Still with me? Good. In other words, when Coakley picked Sunday as the "first day of the week," then Saturdays and Sundays stuck out as the warmest days of the week. But if he picked Thursday as the "first day of the week," Wednesdays and Thursdays emerged as the warmest days of the week.

How? Why?

It is an obscure statistical artifact called "Serial Correlation."

Coakley explained in his paper that this statistical anomaly pops up because things like daily temperatures don't vary randomly. They rise or fall steadily over periods that are longer than one week.

The technical phrase for this is "day-to-day temperatures are positively correlated." As an example, if the temperature rises steadily for a while (as it does every Spring), no matter which seven days you pick, the last day of any period you pick would be the warmest. This would happen regardless of whether your "week" started on a Sunday or a Thursday.

Likewise, as the temperature drops steadily over time in Fall, the warmest day of any seven-day period would be the first day.

Does this apply to rain? Yes, since seasonal variations make for "wetter" and "dryer" periods with cycles that are much longer than a week, just like seasonal variations in temperature.

A second paper contradicted the "weekly cycle" of precipitation more directly. "Weekly Precipitation Cycles along the Northeast Corridor?"[5] Looked at 20 years of precipitation data from seven sites along the east coast of the U.S. The study was unable to find any weekly cycles in precipitation intensity or frequency, and clearly stated their efforts to avoid "Serial Correlation" in the data.

What does this mean to beekeepers, aside from the reassuring knowledge that, despite appearances, it really does not rain more often on weekends?

Well, think about bee populations, pest populations, the number of nectar-producing blooms, and the seasonal changes that drive beekeeping.

"While annual weather cycles are the expected results of seasonal change, weekly cycles could only be the result of human impact. Only humans follow a cycle of activity based upon the concept of weeks."

All aspects of beekeeping are clearly subject to gradual cycles of "increase" and "decrease," trends that follow the seasons, just like temperature does. These cycles are long term, often longer than the length of most projects that study bees. Both data collection and manipulation of colonies in studies have arbitrary "start" and "end" points.

It may seem overly pedantic to use the term "Serial Correlation" when the plain-English translation would be "natural seasonal variation," but the effect described in the 'Nature' paper was not a result of the "facts" or "the data," but, apparently, the methods used in the statistical analysis of the "facts." The effect mislead the researchers, and the many highly-qualified people who review and critique papers prior to publication in "peer-review."

Those of us who work in the sciences are familiar with the many ways that the same set of results from a study can be interpreted, but it is rare to find exactly opposite conclusions being drawn from data that is "clear and compelling," not subject to argument, experimental error, or different measurement methods.

The lesson is that even when you stay out of the rain, sometimes the choices made in statistical analysis alone can render even seemingly impressive data "all wet."[6]

Or, as Lord Ernest Rutherford, winner of the 1908 Nobel Prize in Chemistry, said:

"If your experiment needs statistics, you ought to have done a better experiment."[7] **BC**

James Fischer keeps bees in Virginia where over seven inches of rain fell in May. He has a want-ad in the classified section seeking gopherwood and breeding pairs of animals.

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4 [illegible] 02-0273.pdf Kevin J. Coakley, 2003 "The Warmest Day of Any Week Tends to Occur on the First or Last Day of That Week" Bulletin of the American Meteorological Society : Vol. 81, No. 2 pp 273-283

5 DeLisi, Mark P., Alan M. Cope, Jason K. Franklin, 2001: "Weekly Precipitation Cycles along the Northeast Corridor?" Weather and Forecasting: Vol. 16, No. 3, pp. 343-353.

6 Note that no specific bee-related research is pointed out as making this type of error. No bee researchers were harmed in the production of this article.

7 N. T. J. Bailey: "The Mathematical Approach to Biology and Medicine" Wiley, 1967

How Many Drones?

"Drone management is critical in a bee breeding program – but it's not easy."

Larry Connor

Drone numbers are dynamically regulated within a hive of bees. Healthy queens in vigorous colonies rarely produce drones during periods of death and in the winter. It does not make any difference if it is South Florida in June or Ontario in September, when the nectar flow ends-thereby shutting down incoming resources – the worker bees "lock" the oldest drones out of the hive and keep them from re-entering the colony. If you look at that time of season, you will often see a fistful of drones clustered near the entrance – under the bottom board – until they weaken and die.

Even in an ideal drone-producing environment, there is an upper limit to the number of drones a colony will produce and support. Feral colonies build drone cells in abundance, but rarely use all of them for drone brood production at the same time. These cells double for honey storage. Manufactured drone cell foundation should be part of every beekeeper's operational plan, for these combs can produce many drones, and in my opinion should be placed in every colony with a quality queen. Usually two frames is the limit, since the queen stops laying into additional drone cells or the workers trim (eat) the extra eggs she deposits there. However, many commercial queen producers successfully use three deep drone combs in **drone mother colonies** in mating yards. In this environment, of course, many drones are eliminated during mating, so the supply dwindles rapidly unless replaced. Colonies headed by queens possessing undesirable characteristics should not be supplied supplemental drone comb as a routine principle of management.

If you remove a frame of sealed drone brood from a colony its absence stimulates additional drone production. This suggests that drone brood, including sealed brood, produces a brood pheromone that regulates colony drone production.

Haploid drones from diploid queens

When we look at a child, a puppy or a baby chick, we see genetic traits of both parents in the new generation. We also see that in worker bees, where the queen and one of the drones (represented as a spermatozoa in the queen's spermetheca) she has contributed to the genetic makeup of the daughter worker bee and queen. But when we look at a drone bee we see only the genetic contribution of the queen, because of its unfertilized, haploid nature of the drone (the drone has no father).

Many beekeepers seek ways to incorporate certain genetic characteristics into their stock. At this time, in publications like this one, we find offers for queens demonstrating increased hygienic behavior, quicker brood developmental time and stock from certain geographic areas of the world where mite resistance has been demonstrated. Some of these breeder queens are expensive, and often they are instrumentally inseminated. As a rule, II queens are harder for beekeepers to introduce and maintain in a colony, so you are looking at a queen that is both very expensive and may not last through the season. What's a beekeeper to do?

The easiest way to incorporate this genetic information into an **environment of bees** is to use a drone management method to produce as many **drone mother colonies** as possible, and manage the resulting colonies for maximum drone production. This will allow you to produce a maximum number of desirable drones to mate in your mating yard or your production colonies. All the mated queens you successfully produce from the II breeder queens will produce drones 100% true to that stock, because the drone is haploid and no genetic crossing has taken place.

Thus, you have two options to incorporate genetic traits into your bees. You may produce as many daughter queens as possible from the breeder queens, and use them in your honey production and pollination colonies. The other, equally valid method is to produce large numbers of **drone mother queens** that will carry the genetic information you are paying for into another cycle of mating. Since these are naturally mated queens, you may be able to maintain surviving drone mothers for a number of years [assuming you have taken the time and effort to mark and or clip the wing of such queens to insure identification].

I would produce large numbers of daughter queens from such quality queens, especially those with mite and disease resistance characteristics. I would graft from a *mixture* of Russian and other stocks and *saturate* my neighborhood beekeeping environment with these daughter queens so the resulting

Continued on Next Page

"Use a drone management method to produce as many drone mother colonies as possible, and manage the resulting colonies for maximum drone production."

drone population in that area is highly similar. I would even give away ripe queen cells to local hobby beekeepers making increase colonies because these cells contain queens which will produce desirable drones for the beekeeping environment I seek. This method increases the frequency of desirable genes in a beekeeping operation, and should be encouraged.

Migratory and large beekeepers frequently overlook this bonus obtained from the genetics of the drone's genetic makeup. Let's say that the beekeeper has spent days searching colonies to serve as breeder queens. They may produce several hundred to many thousand daughters. There will be variation in the daughter colonies because the queen mated with an average 20 different drones, also from preferred or selected stocks, so there are 20 subgroups of queens with the same mother but different fathers.

Now, if the beekeeper moves bees a lot, there will be increased supercedure in the colonies and between15 to 35 percent of the queens produced from these breeder queens will be gone by summer, and have been replaced by supercedure daughters. Here is the big question: What about the drones the supercedure queen produces. Are they usable?

They are. Because drones are haploid, the drones produced by supercedure queens will be genetically identical to the queen. The sperm stored in her spermatheca are not used, and thus we see only the influence of the grandfather drone on the mating. In fact, drones are essentially flying gametes of the queen. This means that you may safely use the supercedure queens in a breeding scheme *which produces many drones for natural mating.*

Mating Saturation and Hybrid Queens

When I joined on with the Genetic Systems operation, I spent the summer of 1976 working with **Dr. Bud Cale**. As the developer of the **Starline and Midnite Hybrid** queens, Dr. Cale had developed a four-line hybrid modeled after the genetics of the hybrid corn success. Using instrumental insemination, he developed the "**criss-cross**" breeding method, where the queens from the previous year were used as the drone mothers, and they would mate naturally with virgins from unrelated lines.

The key to success to the criss-cross method was drone saturation. Drones produced by the queens raised the previous year were drone mothers, and if they superceded, resulting drones still carried the genetics of the drone mother breeder. In genetic shorthand we can make these destinations:

Starline and Midnite bees were AB queens (grafted from A line queens instrumentally inseminated to B line drones) mated to CD drones (the previous year's breeder queens were CD queens and produce CD drones).

The resulting queen was noted as ABxCD, but all the worker bees she produced were ABCD workers. The drones she produced were AB drones.

If this queen was superceded, that virgin was ABCD. If she mated with unrelated drones, she was identified as ABCD x Ra (for random or unrelated stock).

The fact that the haploid-diploid mechanism exists let the Starline and Midnite bees supercede without impact on the resulting productivity of the colonies. However, if another supercedure were to happen, this genetic stability was reduced.

Drone Congregation Areas

Key to our understanding mating of queens and drones, is our knowledge of the complex behavior of mating. In other bee species, like bumble bees, virgin queens may encounter drones and mate most anywhere. This may be done in controlled situations, even inside.

With honey bees, mating takes place in defined areas called **drone congregation areas**. It is thought that these areas are formed by natural features of the landscape, and are used year after year. Within these areas drones from many area colonies fly between 30 and 50 feet in altitude. Virgin queens, usually from other colonies, fly to these areas for mating. There may be many drone congregation areas (called DCA's) in an environment, reducing inbreeding between virgin queens and brother drones from the same colony.

Drone Saturation

If a cooperator on the Starline or Midnite program followed Dr. Cale's recommendations, the mating yard would be surrounded by drone mother colonies at quarter mile intervals up to two miles away in all directions from the mating yard. These meant that hundreds of colonies could be dedicated to drone production, and were managed with drone comb to supply a continuous supply of the correct drones. The actual number of colonies depended on the number of mating nucs being used. The exact number of colonies is still a guess, but we will attempt some educated recommendations.

Dr. Cale knew that, beekeepers being beekeepers, it would be impossible to obtain anything close to 100% mating accuracy, In fact, even 50% mating accuracy was rarely accomplished (he used a genetic marker, the cordovan gene, in the lines to measure mating accuracy) Two things happened. First, he learned that even the best queen producers rarely exceeded fifty percent mating accuracy. Second, he spread the cordovan gene – a recessive gene – throughout North America, reflecting the power of the commercial beekeepers using hybrid queens.

Drone saturation is still poorly understood, but I can explain that two factors are at work here. First, you need large numbers of mature drones for accurate matings, and

that is just hard to accomplish. Second, you need to spread these drones out into the surrounding mating environment so that all colonies *for miles* produce desirable drones.

Dr. Cale also selected lines with a trait he called **good combining ability**. In other words, the Starline and Midnite bees could mate with non-related drones and the resulting colonies were highly productive, very usable colonies. In such a scenario, the need for 100% mating accuracy and total genetic saturation is less important

But what about bees which combine poorly, like the African honey bee? Here the answer is difficult. First, one must know what percentage of mis-mating (queens mated with African drones) you can accept in a colony, and the frequency of such colonies in an apiary. Is this five percent? What numbers of Africanized drones are you dealing with? Are five percent of the colonies in the area Africanized? 35%? 95%. That number or frequency will tremendously impact your genetic mating saturation strategy. Are Africanized colonies being routinely trapped and killed? Or are the bees well established in the perimeter of your mating site?

"Even the best queen producers rarely exceeded 50 percent mating accuracy."

Successful mating in an isolated area is one thing, but successful mating in a saturated area is entirely another. What is a successful mating? It is easy to understand that a colony with highly defensive behavior is unsuccessful. But what about colonies with other traits like poor wintering ability or absconding after the nectar flow? How will you measure these traits and their impact on your mating accuracy?

Drone saturation is at least a major answer to the issue of accurate queen mating, if not the entire answer for most beekeepers. But how does one obtain saturation without large numbers of colonies?

I conclude with the following thought: For most hobby beekeepers with only a few colonies, there is little need to be concerned about the drones mating with your queens because you have nearly no control. Supersedure queens from your colonies will find a drone congregation area and mate regardless of your efforts to supply the drones in another colony. And in spite of parasites, diseases, mites, pesticides and beekeeper error, virgin queens and healthy drones are still very likely to find each other and successfully mate. If all the beekeepers in your community – your mating environment – were able to coordinate genetic stock, you might be able to obtain better mating control with drones of desired type. Given the independence of the average beekeeper, this is a rare event. BC

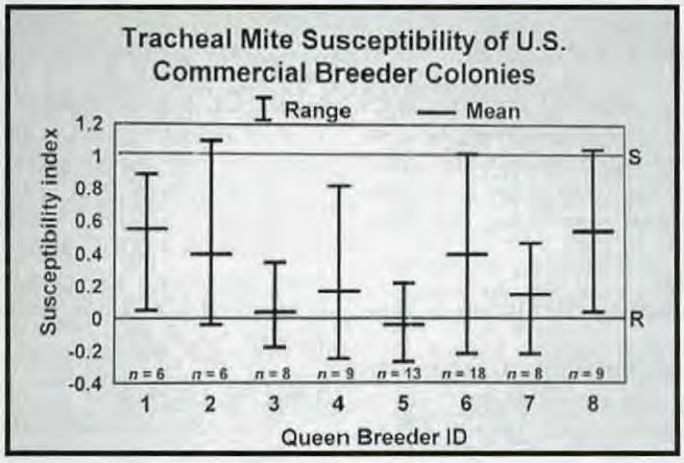
Dr. Lawrence J. (Larry) Connor is owner of Wicwas Press of New Haven, Connecticut where he edits and publishes book on bees and beekeeping. He may be reached at LJConnor@aol.com or through the website www.wicwas.com.

Tracheal Mites Should NOT Be A Problem!

Medhat Nasr

At the annual meeting of the American Honey Producers in 2003, we visited the USDA-Bee Laboratory at Baton Rouge. During this visit, we looked at a graph of levels of resistance of different bee stocks to tracheal mites produced by Dr. Bob Danka and Dr. Jose Villa. It renewed the discussion about the threat and status of tracheal mites in honey bees in the U.S. Some beekeepers say that they never treat for tracheal mites. **Tracheal mites are no longer a threat!**

In the graph, the sample on the right (#8) represents the resistant and susceptible strains that are kept at the Baton Rouge lab as a reference. The other samples (1-7) to the left of the lab sample are from seven commercial queen producers who participated in the evaluation of resistance. Results showed that some are consistently excellent as in breeders 3 and 5 (30% of tested breeders). The highly susceptible ones were bees supplied by breeders 1, 2, and 6 (40% of tested breeders). This means, there are high variations in resistance for tracheal mites in the tested stocks. Thus, queen suppliers can't consistently supply resistant bees. Some queen suppliers have very good resistant stocks and others have very poor resistant bees.



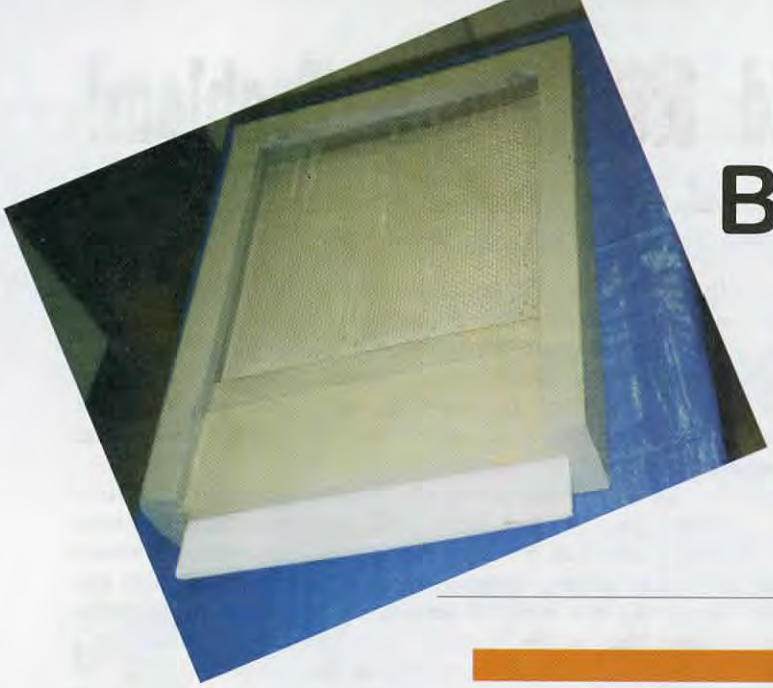
Dr. Villa (USDA-ARS, Baton Rouge) commented on this ongoing debate about tracheal mite's threat to the beekeeping industry. He mentioned that some of the researchers with experience in tracheal mites (Bob Danka, Lilia de Guzman, Medhat Nasr and Villa) believe tracheal mites can cause significant problems. These problems can be easily resolved, but tracheal mites are also easily forgotten.

Villa continued to report that recent imports from the Old World (British Buckfast, 1990, Yugoslavian bees, 1989) and far-Eastern Russian (1997 and following years) are consistently *very resistant* to tracheal mites. 'New World' stocks from programs that have actively selected for tracheal mite resistance using Quick tests (Ontario Bee Breeders-Medhat Nasr's program) or using a field selection have resistance. We have no direct experience in the field selection with queens from Ohio Queen Breeders, or from Sue Cobey's New World Carniolans, or from Marla Spivak's Minnesota Hygienics. Given that they actually look for tracheal mites, cull weak colonies in the spring and don't treat for tracheal mites, they report low Winter losses in their stocks (see their web-pages). It seems that their selection for tracheal mite resistance is working and these stocks have few problems with tracheal mites. The tracheal mite resistance is a trait that is not exclusively possessed by any stock, race, bee color, etc. Active selection and breeding can increase this trait in any bee stocks to a degree that can protect bees from tracheal mites.

From my research and experience with tracheal mites for the past 16 years, I (believe that tracheal mites continue to be a problem. It depends on where you are located. Colonies with high infestations in the south do not suffer from colony mortality by tracheal mites. They suffer from low performance and slow spring build up. Colonies with similar high tracheal mite infestations in the northern climates experience high Winter mortality. The reported Winter mortality caused by tracheal mites has become cyclic. Previous records show that high Winter mortality of bee colonies occur every 3-5 years in the northern states. It depends on Winter conditions.

In a recent survey in New Jersey, I found that colonies wintered in the south (Florida) had high levels of tracheal mites. As soon as these colonies moved up to New Jersey in early Spring for blueberry pollination, dead bees were found in front of the hives. Those dead bees had high infestation levels with tracheal mites. Meanwhile, colonies that wintered and survived the Winter in New Jersey had very low mite levels. By Fall, tracheal mite infestation levels were up to 20-40% infestation. This high level of tracheal mites could explain why beekeepers have to move their bees quiet fast to Florida for wintering to avoid Winter losses in New Jersey. Colonies with similar levels of infestation wintered in New Jersey would be expected to die during Winter months. These results could explain that the tracheal mite problem still exists.

Beekeepers continue to have different opinions about tracheal mites based on their location, wintering conditions and source of queens used (resistant vs. susceptible stock). Remember, U.S. and Canada have a wide range of climatic conditions. Breeders should actively select and breed for tracheal mite-resistant bees to maintain healthy colonies. Customers should start asking their suppliers what they do or don't do about breeding for tracheal mite resistance. BC



Screened Bottom Boards Semi Mass Produced

A Gary Shilling

The experts are singing the praises of screened bottom boards. They keep *Varroa* mites that fall off bees from waiting on the bottom board for the next host. Accompanied by a sticky board, they facilitate mite counts. And they increase air circulation on hot Summer days so the bees can spend less energy air conditioning the hive and more on producing honey.

The Specs

So I decided I better hop on the screened bottom board buck board. I wanted

1. A bottom board with a screened bottom, not a screened unit that goes over a conventional bottom board. Why fool with two pieces when one will do nicely?

2. To be able to clean out the dead mites and other debris without unstacking and restacking the hive. Extra hard work.

3. A slot for a sticky board.

4. An insert board to reduce air circulation in Winter.

5. Access to the sticky board and insert board from the front. Some of my hives are too close together to insert boards from the side. Others are close to fences so the back is out as an option.

6. A strong bottom board that can easily support 200 lbs. or 300 lbs. (I hope) of honey. Who wants one that may be a thing of beauty but a joy for only one season?

I checked out the commercial offerings and decided that my requirements would be best met by designing and making my own. This added three additional specifications.

7 Simple design and construction. I'm a decent woodworker but no cabinet maker.

8. Interchangeable parts. I planned to make enough for at least half my 70 colonies to get a statistically significant test of whether screened bottom boards did in fact help the bees. I ended up making 46, so the ability to semi-mass produce them was important.

9. A design that would utilize readily-available materials. Since I'm a world-class pack rat, this meant the wood I've been saving in the basement for years, even decades – the same used but valuable lumber that my wife and our insurance agent regard as a fire hazard.

Trial And Error

The conventional bottom board, of course, is essentially two side and one back rails, fully one-inch thick, that are dadoed so they look like "Cs" on their

Parts ready for assembly. Photo 1.

Parts with plate joiner biscuits installed. Photo 3

Parts For Screened Bottom Board

2 side rails	2x4x20½"**
1 back rail	2x4x16¼"*
1 landing board	¾"*x5½"**x14½"*
1 bottom brace	¾"**x4"**x13¼"*
1 wire screen	16½"**x14¼"*
6#10 wood biscuits	
2 wood plugs	1-3/8"*x5/8"*x¼"**
1 insert board	5/16"**x14¼"*x22½"**
waterproof glue	

1½" and 2½" air nails, or hand-driven nails or screws
¼" crown x 1" staples or hand-driven staples

*critical dimension
**not critical

Figure 1.

Frame parts ready for assembly. Photo 2.

Bottom board before installing screening and leveling board. Photo 4.

ends. Four or five ¾-inch thick cross boards, sometimes with lap joints, are inserted into those dadoed-out slots to form the bottom. So, not wanting to reinvent the wheel, I initially decided to follow this same design but cut a square hole in the insert for the screen. I made three variations on this design.

Folly 1. A piece of plywood as the insert. It was easy to make, just a rectangle with a square hole, but would plywood hold up in damp conditions? If it did, why don't they make hive bodies and supers of plywood?

Folly 2. An insert constructed of four narrow pieces of wood with lap joint corners that frame the screened hole. Nice idea, but making lap joints with scrap wood of slightly varying thicknesses that will slide easily into the side rail grooves is a lot of work.

Folly 3. Same as Folly 2, but rather than lap joints, butt joints that are reinforced by wood biscuits inserted in slots cut with a plate joiner. Again, a lot of time and effort with irregular lumber.

And with each of these three Grand Designs, I also needed to cut slots in the side rails to fit the sticky board and the Winter insert. I figured that even after moving down the learning curve, I'd spend two or three hours making each one of these beauties, so to make 40 or 50? Forget it!

An Attack of Common Sense

While fretting over spending more time on this project than I could afford, I had an attack of common sense. Rather than put the wire screening over a hole in an insert that slides into the side rails, why not attach the screen directly to the side and back rails? This revelation was hardly on the level of Langstroth yelling, "Eureka!" after he figured out bee space and movable frames, but I still felt good about it. With this design, the screened bottom board consists of two side rails, the back rail, a landing board in front. Also included are another piece of lumber, two plugs and six wood biscuits, which I'll cover later and, of course, the screening as well as the Winter insert or sticky board (see photo 1). Another advantage of this design vs. my three Follies is that the entire bottom is screened. So more holes for the mites to fall through, and more space for the air to enter and move up through the hive in the Summer.

In addition to the usual hand tools, for this job you'll need a radial arm saw such as I use or a table saw to cut the wood and, especially, to cut the dados in the side and back rails. Not necessary but very useful are an air finishing nailer with 1½-inch and 2½-inch stainless steel nails to put the frame together, an air stapler for attaching the screening, a plate joiner and wood biscuits for strengthening the frame joints, and a jointer to uniformly size the lumber.

I used old 2x4s for the rails. The plus is that I had an ample supply. Also, a 2x4 is wide enough and thick enough to cut the 5/8-inch deep by 1-3/8-inch long slot and still have plenty of wood for strong side and back rails. The negative is that 2x4s aren't of uniform size, quite apart from the fact that they don't measure 2 inches by 4 inches, unless they come from a house as old as ours, built in 1907 The 2x4s in my vast collection ranged from 1-3/8-inch to 1-5/8-inch thick vs. the standard 1½ inches, and from 3-3/8-inch to 3-5/8-inch wide compared to the 3½ inch norm. So you need to either plane them to uniform dimensions or make appropriate allowances in the depth of the dado cuts, etc. I did some of each which made the parts only partly interchangeable. The dimensions I list, however, assume that the 2x4s measure 1½-inches by 3½-inches. None of the wood I used was pressure treated even though the two coats of paint stain I applied would probably have prevented any leaching of the chemicals in treated lumber. I figured it is better to put up with the usual rot over time than to risk endangering the bees or the honey.

I used woven stainless steel screening with six wires per inch, a gift from my friend, Peter M. Cronin, President of Industrial Alloys Inc. Galvanized screening with eight per inch spacing is more readily-available, but six per inch allows the trash to fall out easier while still being too narrow for the bees to squeeze through. For complete parts list, see Figure 1.

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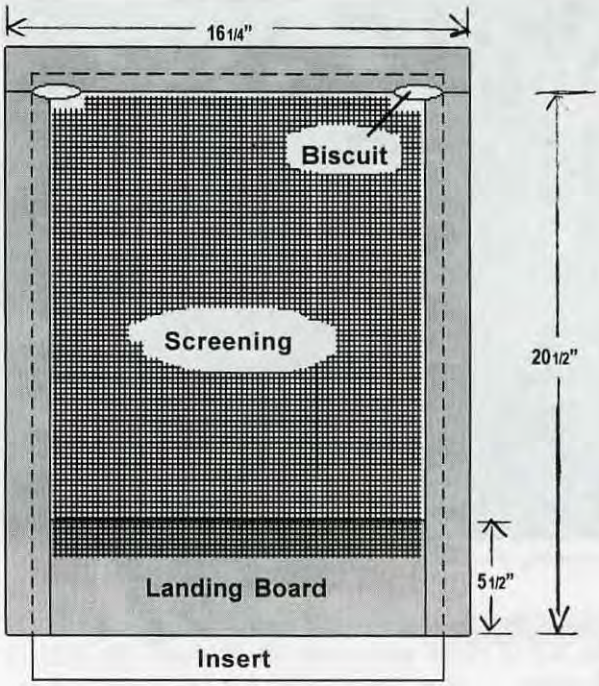

Figure 3 Top View

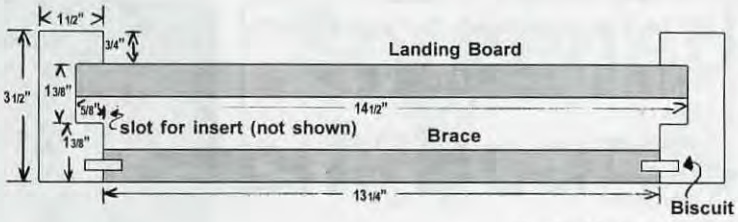

Figure 2 Front View

The Cutting

First, cut the dado slots 5/8-inch deep and 1-3/8-inch long in the 2x4s (Figure 2) for the side and back rails. This length works with a 5/16-inch thick insert board, and 5/16-inch plywood is what I had in my fabulous lumber collection. For thicker inserts, increase the dado length accordingly. Cut the dados in your 2-ft., 4-ft., 6-ft., 8-ft. lumber, whatever you have, before cutting the rails to length. It's safer and a whole lot easier than the reverse.

Next, cut the rails to length. The back rail length, 16¼ inches, is critical since that's the width of most of the hive bodies you set on top of the screened bottom board. The length of the side rails I used, 20½ inches, isn't critical as long as they extend beyond the 19-7/8-inch length of the hive bodies to provide a land-

USING THEM

Ron Rudiak

The last two seasons have led to an improvement in my attitude toward *Varroa* mites and I can say that this Summer is the first time in many seasons that I did not find myself overly concerned about these parasites.

I began to use screened bottom boards in 2000 as a tool to continuously monitor mite levels in all of our hives. The screens were in place when I put in the required two strips of Apistan®. It is interesting to observe *Varroa* mites that fall through the screens onto the metal trays placed underneath. Most of the mites come down on the first and second day of treatment. The majority remain alive (and motionless) on the metal trays, some for as long as seven days. These live mites can quickly attach themselves to an object, such as a pencil tip or a bee, placed within their reach. Without the screened bottom board, the mites that fall would simply re-attach onto a passing bee for a free ride back into the cluster of bees. The process of detaching in the presence of Apistan® or formic acid, falling onto the bottom board and re-attaching onto a passing bee may repeat many times until the mite finally succumbs to the effects of fluvalinate, starves to death or dehydrates because of being intermittently detached from a food source for too long.

When colonies are not being treated with Apistan® or formic acid, screened bottom boards continue to trap mites as they naturally fall from within the hive. Once *Varroa* mites fall through the screen onto the tray they are taken out of production permanently because they cannot re-attach to a bee. It has been shown that a large percentage of *Varroa* mites can be removed from a colony when this system is in use. Screens help to control mites for 12 months of the year without the danger of mite resistance developing.

Including *Varroa* screens in a beekeeping operation is economical as well. If one decides to build their own *Varroa* screens during the Winter, they can be produced easily from scraps of lumber, the only cost is for the metal tray (approx. $3), screen, glue, nails and paint. Our screens, which go between the bottom board and first super, cost approximately $4.50 each and should last for 10 to 20 years because the sturdy design does not allow water to enter the joint where the screen is attached. Sliding the tray out from the back of the hive about an inch provides additional ventilation for the hot days of Summer. Plugging the entrance and removing the tray allows *Varroa* screens to double as moving screens.

A tray the size of the bottom of the hive, placed upon the bottom board, is essential for the proper operation of a *Varroa* screen. The most important duty of the tray is to enable accurate monitoring of mite levels within the colony To monitor, it isn't necessary to cover the entire surface of the tray with an oily product, a little around the edge will do. In actual practice I have found that greasing the tray is largely unnecessary because the *Varroa* mites don't stray very far from the point where they fall but simply wait for a bee to pass within reach. These trays have to be scraped clean

ing platform. Notice (Photo 4) that the side rail ends are butted against the back rail, not vice versa. That way, if the thickness of the 2x4s varies, it will change the uncritical length of the bottom board, not its critical width.

The landing board width isn't critical, but it should be wide enough that the bees land on it before they get to the screen. Otherwise, they can lose their pollen when they land directly on the screening. I used 5½ inches because I had 6-inch boards which, of course, aren't 6 inches, but only 5½ inches wide. The 14½-inch length and ¾-inch thickness are critical to make the thing square and provide the proper slot for the insert.

The brace below the landing board may seem like overkill but, believe me, it's needed to get this critter assembled and square. The length, 13¼ inches, is critical to fit the opening, but the width isn't, nor is the thickness as long as it's 1 3/8 inches or less so it doesn't extend above the insert board slot (see Figure 4). I used some 4-inch boards I had around that are actually 1-inch thick, but ¾-inch thick is fine. But to insure ease of assembly, and to keep the space under the screen open, be sure the brace is at least an inch narrower than the landing board.

Screening cut to size and scrap. Photo 5.

The Beauty of Biscuits

At this point, I had the frame parts cut and stored in milk cartons "borrowed" from a local dairy (Photo 2). In the picture, you might make out the plate joiner grooves cut in the rails and braces, and you'll note the biscuits inserted in the rails in Photo 3. I set up clamped boards, in effect, jigs to cut these grooves on

Continued on Next Page

periodically to remove accumulated debris, especially in the Spring when the bees are doing a lot of house cleaning. Checking mite levels takes only about one to two minutes per colony. Mite checks show that, initially at least, not all colonies may have the same mite levels within a beeyard. If colonies are left untreated, a colony collapse will rapidly spread mites among other colonies including those with low levels of parasitism.

The level of mite infestation can be estimated by counting the mites that fall naturally onto the tray during a 24 hour period. A useful rule of thumb is that one fallen mite during this period means that there are 500 alive within the colony, two mites, a 1000 and so on. In some cases it may be more convenient to use a longer time period such as 72 hours. In this case divide the fallen mite count by three to get the mite count for 24 hours.

In the Spring of 2000, because we had the ability to continuously monitor mite activity, I decided to check the effectiveness of several different procedures of applying fluvalinate. I divided my hives into groups, some were wintered as singles and others as doubles. The singles and half of the doubles received one Apistan® strip while the other half of the doubles received the recommended two strips. In all cases, during the first two days there was a significant initial mite fall when Apistan® was applied. The amount of mites counted rapidly decreased for the next several days reaching nearly zero in 21 days. There was no significant difference in the doubles in using one strip or two. In half of the singles and half of the doubles the strips were pulled out after 21 days and the mite levels monitored during the course of the summer.

Overall there was no significant difference noted in the colonies which had received the 21 day or the 42 day treatments using one strip or two. The strips that had been used for 21 days were marked with a punched hole, placed in a plastic bag and refrigerated. These strips were used again for a Fall treatment for 21 days and discarded.

In 2001 all of our colonies received a 21 day treatment with a single strip. This treatment has resulted in the mites being reduced to very low levels in all colonies, which are healthy and productive. These results I attribute to the integration of a screened bottom board to the chemical treatment. By using a single strip for two three-week treatments the cost for treatment is reduced accordingly.

Because of the shortened treatment time we were able to remove the strips just as the Spring honey was starting to come in from dandelions. We supered up for the Spring honey flow and at the same time installed pollen traps. Completing *Varroa* treatment earlier in the spring resulted in more extracted honey from early sources plus pollen collected for sale and feeding our colonies next Spring. BC

Note: *The foregoing information is based on the author's experience and has not been scientifically evaluated.*

Ron Rudiak traps mites near Winnipeg, Manitoba, Canada.

Painting insert boards. Photo 6.

Screened hive bodies in my paintroom a.k.a garage.

a mass basis. If you've used a handy dandy plate joiner, you know what I'm talking about. The biscuits add amazing strength to butted joints, and with them robust corners can be made much faster than with lap, box or dovetail techniques. They also hold the frame together while nailing. You can simply glue and nail or screw the butt joints without the biscuits, but that's harder and the joints won't be nearly as strong. Notice that the biscuits are used in both the top and bottom of the side and back rail corners, the parts of the rails above and below the dadoed slots. This means two biscuits for each corner, a total of four.

Now I reveal the mystery over which you've been holding your breath – the purpose of the bottom brace. It's butted between the bottoms of the side rails at the front with one biscuit on each side (Figure 2). This, in combination with the side and back rail corner joints, makes a sturdy four-sided frame into which the screening can be stapled. And the screening needs to be installed *before* the landing board. So, without the bottom brace, the front ends of the side rails would flap in the breeze while you're trying to put in the screening. You'd have a ghastly mess. I know, I tried it. The bottom board brace also is important for strength at the front of the beast. You can't get into the side rail slots with a plate joiner, so you can't securely fasten with biscuits the landing board which fits into these slots (Figure 2). Finally, the landing board and brace together provide about as much strength at the front as the rails furnish on the sides and back. This baby may not be gorgeous but she's great for strength.

Finished screened bottom board.

Tips on Putting The Blasted Thing Together

At this point, you are ready for assembly. Do it on a flat surface so the finished screened bottom board will be plane on the bottom and won't rock on the concrete blocks or whatever else you use under it, assuming they are flat. Apply waterproof glue to the biscuits and joint surfaces of the two side and back rail corners and the bottom brace. Use a rubber hammer to encourage the whole thing to fit together, and if you have trouble, get a bigger hammer. Check the corners continuously with a carpenter's square, unless you don't care about square corners.

I used pipe clamps to hold the frame in place in the position I wanted it, which isn't necessarily the position it wants to assume. Then I banged away at all the joints with my air finishing nailer and 1½-inch and 2 ½-inch stainless steel nails. I hate rust, don't you? You can, of course, use hand-driven nails or screws. You should also prepare two plugs, 1-3/8-inches by 5/8-inch by ¾-inch. They're glued into the holes on each end of the back rail that exist because of the dadoed slots. This may not be clear, but it will be obvious when you get to this point. They also keep out some of the rain and its wood-rotting aftermath. At this point, your creation should look like Photo 4. If it doesn't, I've probably done a lousy job of explaining what I did. Notice that the biscuits protrude from the corners. That's because they are wider than the side rails. You could cut off these protrusions, but I figured that they won't bother the bees, so they don't bother me.

Screening and Landing Board

Cut the screening (Photo 5) into 14¼-inch by 16½-inch pieces. The opening width is actually 14½ inches, but unless your wood and you are more precise than I, you'll need a little extra space. The 16½-inch length allows about a 1-inch overlap on a 5½-inch wide landing board, so this dimension varies with your landing board width.

Turn the bottom board so it's resting on its top.

Now you can insert the screening and staple it to the top of the side and back rail slots. If you make a mistake and place the bottom board right side up, you'll staple the screening to the bottom of the slots, which you'll regret. I used an air ¼-inch crown stapler with 1-inch long staples, which speeds the job. Still, getting the staples to bridge the wires in the corners and not end up uselessly between them is challenging.

Next comes installing the landing board. Apply glue to both ends and slide it into the side rail slot and under the front 1 inch of the screening. Trim the length to fit, if necessary, but before you apply glue. Less messy that way. Insert wood wedges in the bottom of the slots on both sides to hold the landing board at the top of the slots until it is fastened permanently in place. Then nail it from the sides and then from the top where it fits into the slots. Staple the screening where it overlaps the landing board, and the screened landing board is assembled.

Insert And Painting

The Winter insert, as noted earlier, can be varying thicknesses of plywood, but it needs to be narrow enough to fit easily in the slot that's left below the landing board. That means narrow enough to accommodate the warping to which all plywood is subject. There's nothing more frustrating than an insert board that can't be pulled out without knocking over the whole hive. I made my 5/16-inch thick inserts 14¼ inches wide, or ¼-inch narrower than the opening, to allow for play. The length isn't critical as long as the board extends, when fully inserted, enough beyond the bottom board to provide a handle to pull it out. Mine are 22½ inches long so they extend 1½ inches beyond the opening. Note also that the slot it fits into is 5/8-inch wide (Figure 2), or 5/16-inch wider than the insert board thickness of 5/16-inch. This extra space, too, allows for the inevitable warpage, but should be narrow enough to keep the bees out. Yes, I know, I know, the bee width is about 5/16-inch, but it's less than 5/16-inch after the plywood warps.

To make the Winter inserts also double as mite sticky boards, I painted them white, one coat of latex primer and one coat of latex gloss house paint (Photo 6). You'll want to leave the same side up every winter since it gets dirty with debris, and leave the clean side down except when checking for mites.

Painting the screened bottom boards was another matter. Regardless of how carefully I prime and paint even new wood boxes, the paint always seems to peel sooner or later. So, I've switched to translucent oil-based paint stain, which contains paint and stain and soaks into bare wood well. It wears off in time, but at least it doesn't peel. So, I used two coats of paint stain on the bottom boards – drift wood color, which is what I had available. Another advantage of paint stain is that it doesn't clog the screening as much as regular paint. I covered all the wood surfaces since with the screening, the bottom board is exposed inside and out, and it's tough to apply paint or stain to all the wood surfaces without putting some on the screening.

For the finished product, see photo on opposite page. Just look at that proud beauty!

After I got through the trials and errors and got my production line rolling, it took about one hour to make each screened bottom board. That includes everything from cutting the dados in the side and back rails to making the landing board, bottom brace and insert, assembling the frame, cutting and installing the screening, and the final painting. Building 46 was enough to pretty well get the bugs out of the design and fabrication.

But do screened bottom boards really work, at least in my area of New Jersey? I put them on last Summer, with the inserts removed and the telescoping covers propped up with two wood lathe to increase the upward air flow on hot Summer days. I didn't have them on for the whole season, so I don't know if they increased honey production or reduced mite levels compared with my hives with conventional bottom boards.

Last Winter, I put in the inserts to reduce the air flow, and left them in until warm weather returned. I sure hope that by the end of this season, I'll find out that the screened bottom boards made enough of a positive difference to merit my time and effort as well as the irreparable reduction in my treasure trove of used lumber. In any event, I did get considerable satisfaction from designing and producing them in semi-assembly line fashion. Maybe you'll benefit from my trials and errors, and final success. BC

When Dr. Shilling isn't actively pursuing his hobby as an avid beekeeper, he is an Economic Counselor and Investment Advisor as well as a Forbes Magazine columnist.

Faster • Faster
Motorize Your Extractor

Patrick Driscoll

Many of us own or have seen an economical radial or tangential hand extractor to spin frames loaded with honey. They come in all shapes and designs. If you have ever tried to extract by hand, you find it is an exhausting process especially if your hive is stacked with supers and you have 50 or more frames to process, and you're working on the only Saturday you can allow to get the job completed. It is at that point that you look in your many bee catalogues and peruse the motorized extractors available for $600 to $1000. It is tough to justify the purchase of a commercial extractor, especially if you have no one to share the expense with, like a local cooperative. It can almost be the singular thing that drives you away from beekeeping.

However, hand extractors are readily available, since most beekeepers start with them and then decide that it is too much work, and either borrow or purchase a motorized extractor or haul their messy frames to the next beekeeper with the complete setup. I can bail you out of your dilemma for say $70. Add a motor. It's easy to do and fun!

When you consider motorizing a hand extractor, **keep in mind that you have really purchased a frame spinning basket.** If you have a well made solid basket and center shaft, you can add a motor to it. It is not worth adding mechanization to a poorly designed or cheap or excessively heavy old fashioned basket assembly.

I had found myself in this situation early in my beekeeping days. The first year, I squished drawn comb by hand making balls of wax; naturally this was a very messy process and I had to rebuild all new foundation for the Spring and worse yet the bees had to expend their energy building comb the following season. The second year, I purchased a hand extractor from a beekeeper second hand. It had a wooden handle as a crank and it was not geared, so that one revolution of the crank resulted in one revolution of the centrifugal frame supports and that was a heck of a lot of work and unnecessary sweat.

Since you can pick up a hand extractor second hand for under $100, I thought it would make sense to devise a way to motorize one of them, and as I reviewed the catalogs, it occurred to me that an economical way to make this easier would be to add my own motor, several pulleys and a belt and make my own conversion for a lot less expense. The easiest hand extractors to motorize seem to be the basket style two or three frame extractors, although a six or nine frame can be done with a larger motor.

"If you have a well made solid basket and center shaft, you can add a motor to it. It is not worth adding mechanization to a poorly designed or cheap or excessively heavy old fashioned basket assembly."

Your first choice is to examine your hand extractor and see how the vertical main spin shaft is located in the assembly. In my case I removed the entire hand crank assembly and replaced it with a piece of 2" x ¼" x 16-½" aluminum bar stock readily available at any metals supply or machine shop or catalog supply like McMaster-Carr. Your horizontal support without the hand crank assembly may be just what you need to mount your motor and pulley assembly without adding an aluminum support bar like I had to do. In the center of your support bar you need a polymer or ball bearing to withstand the thrust of a motorized belt drive. The diameter of the main shaft is important so far as the ID of your driven pulley. You need to see what the hub diameter of your pulley has to be in order to have enough stock around the shaft to have a couple of setscrews to tighten the pulley against the vertical basket shaft. You may have to drill out the driven pulley to match your basket shaft diameter. I use XL series aluminum timing pulleys and belt which are readily available. I replaced the supplied setscrews on the driven (larger) pulley with socket head capscrews which have a better bite and are not a balance problem since the rpm's are so slow. I also used blue Loctite 242 (available in auto parts stores) on set screws etc. so I didn't have to worry about them loosening while in the middle of an extraction. I also added a set screw round shaft collar and a couple of washers to the top of my basket shaft to locate it in the top bar.

Your next decision is what RPM you want the fully loaded basket to operate; too fast and the combs in the frames will break up, too slow and there isn't enough centrifugal force to extract the honey from the individual cells. I found that if my two frame extractor's tangential basket loaded with honey worked best at about 150+ rpm. Beyond that, I began to break up wired founda-

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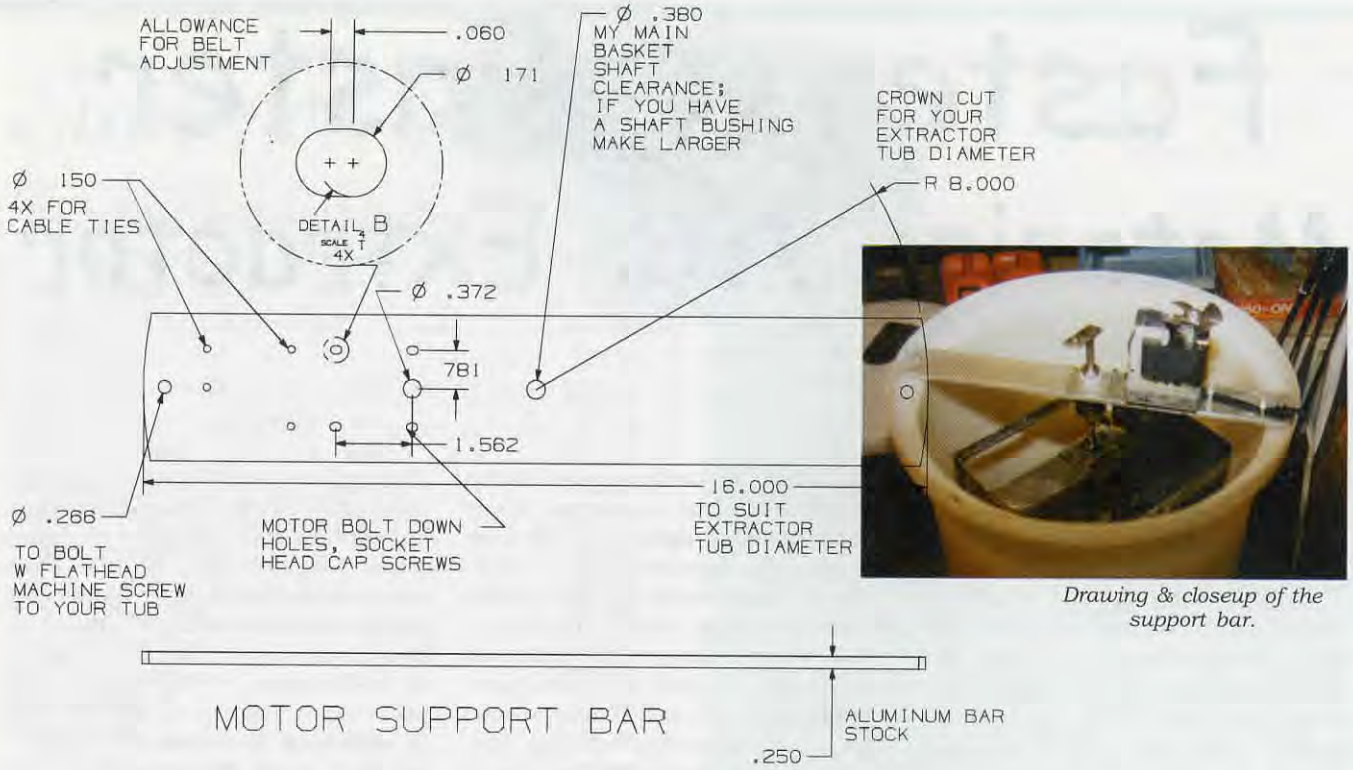
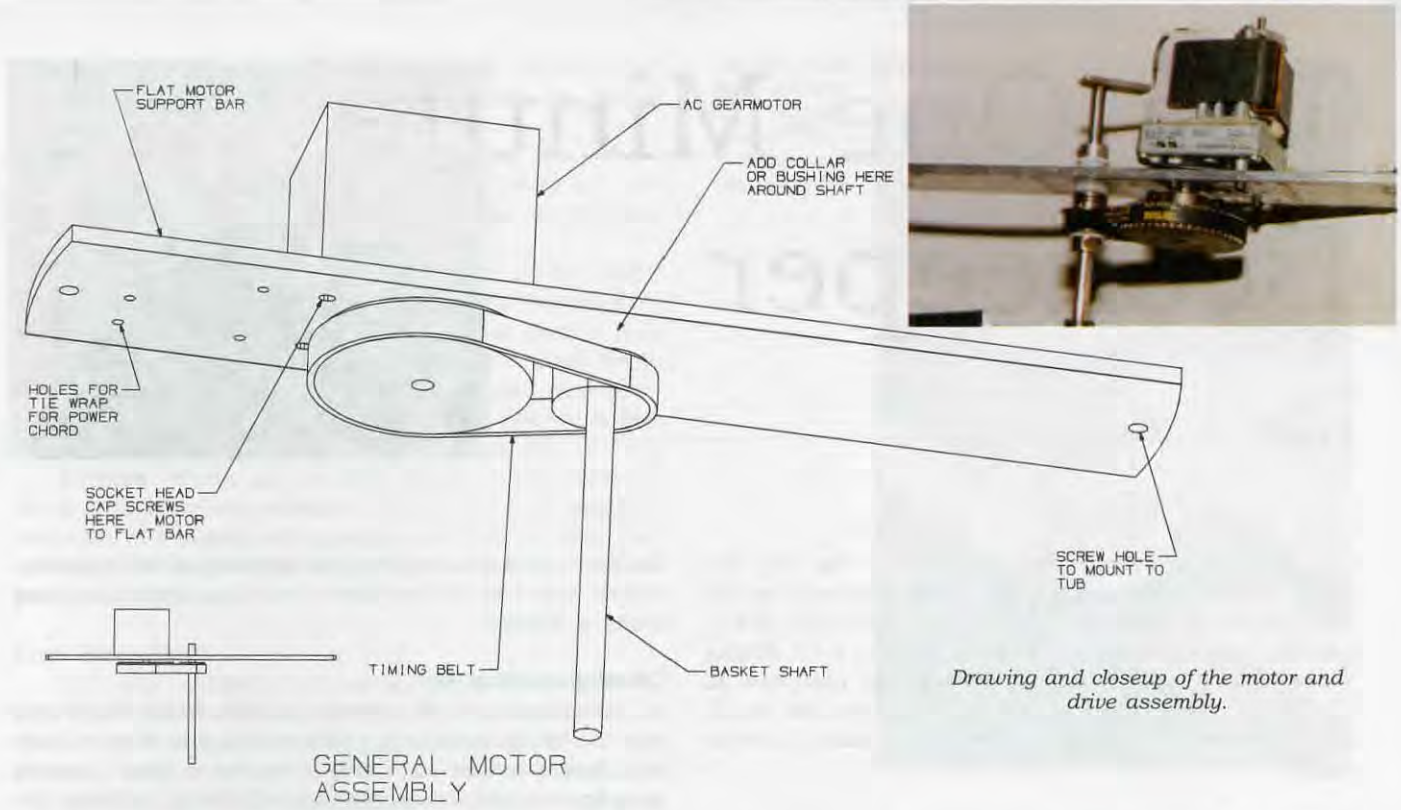


Drawing & closeup of the support bar.

tions. It helps when doing motorized extracting, to wire your frames, thereby giving them the additional support to withstand the forces incurred during extraction. Most fractional horsepower gear motors run either clockwise or counterclockwise; you specify when you purchase them. The advantage of fractional hp gearmotors are that they are a field tested highly engineered component which provide speed reducing/torque multiplying features all in one compact inexpensive unit. They are used in humidifiers, water filters etc throughout your home. I chose an AC gearmotor motor size rated at 60 rpm and used one reduction to bring the loaded basket to a speed of 150 rpm with two toothed pulleys, a belt and a two frame tangential extractor.

In any application which requires shaft speeds slower than that of a straight motor, fractional horsepower gearmotors can be a highly desirable and economical alternative to conventional belts, gears and chains. Expensive extractors have variable speed drives to change the extraction speed, but most beekeepers find a speed they like and use it. Fractional horsepower gear motors like the one I used are very reliable, economical and run at a fixed speed. One needs to make any electrical connection safe, since these are small motors, but still operate at 120 volts. I soldered my connections from the power chord to the motor just to be sure and used heat shrink tubing over them. It would be wise to have a ground fault outlet in your honey extraction room to have additional protection. The entire unit vibrates dramatically until a slight amount of honey is sucked out and the unit becomes balanced.

I settled on about 260 rpm **no load** for the gearmotor and pulley final ratio, which slowed to 150 rpm when there were two fully loaded frames in the basket. I chose a face mount *100 rpm no load* 7 in-lb. torque gear motor with shafts on both sides , and a 18 tooth and 48 tooth steel or aluminum pulley which made the 100 rpm motor 100X 48/18= 100 x 2.67= 267 rpm at the basket shaft *with no load.* NOTE you could also use say a 150 rpm gear motor and a different reduction and different size of your two pulleys depending on your slowdown loss with a fully loaded basket. The smaller drive pulley on the motor has two flanges which keep the belt from coming off. My belt was a no.120XL meaning 60 grooves and 1/5" pitch (XL pitch). Timing belts and toothed pulleys do not have the slippage that V belts have and they are available in small profiles for jobs like this. I use XL pulleys since the pitch is coarse enough to get a good driven load and lightweight enough to do the job. The hardest thing here is to determine your center distance to pick the right belt. You can sketch out your expected setup using the drive pulley OD and the driven pulley OD and about where you want to position your motor on the bar and determine the size of the belt by stretching a thread around the OD's at your expected center distance and then picking a belt by multiplying the pitch by the number of teeth. For my belt, an XL series, 60 grooves X 1/5" pitch =60x2x(1/5)=12" belt length. The belt length is marked on the catalog spec. anyway Stretching a thread around two circles that you draw to scale is technically not the most accurate way since the formulas work by using the pulley's pitch diameter but this method will allow you to choose a belt length from the standard available sizes in the catalogue. The idea is you choose a belt closest to your need and then adjust your center distance to make it work and drill 4 slots in your center support bar. If you want to calculate it exactly and try various pulley sizes go to



Drawing and closeup of the motor and drive assembly.

www.sdp-si.com/Cd and use their fantastic timing center distance calculator. You enter your pitch (distance between teeth -in my drive 1/5") and then try various pulleys depending on the center distance you can live with. It's better to move your motor out as far as reasonable from your center shaft so you will have more wrap around your drive pulley. You will need four slots in your support bar anyway to give it tension when you assemble the pulleys and belt. I also put a small aluminum stock fan on the upper motor shaft to help it run cooler.

You can experiment with your setup. My basket is lightweight stainless steel two frame tangential variety. The important thing is to have the pulley assembly steady and the belt reasonably snug, so that it does not jump teeth on the driven pulley. Remember you are only going say 150-200 rpm. If necessary you can replace your crank assembly with a combination of thrust washers and a collar and set screw. This allows for the radial load on the shaft when driven by the belt and pulley. I also beefed up the shaft support on the bottom of the shaft (in the honey) which positions the loaded assembly vertically with enough clearance for a couple of inches of honey since the one supplied with the unit was very cheap. Remember you need to carry the vertical load of fully packed frames on either the upper bushing on your support bar and on the bushing on the inside base of your plastic drum.

Always operate the device with the honey gate open, since the unit will see greatly increased drag if the frames have to pull through liquid honey and you will overheat or burn out your gearmotor. Shut off your motor if your basket begins to drag in the honey until it exits thru the honey gate.

Remember to remove and rotate frames in order to extract each side. I personally rotate frames such that I extract say 75% of one side, rotate, doing 100% of the other side, then rotate back for the remainder of the first side.

I purchased my belt and motor and pulleys from McMaster-Carr catalogue (tel. 630-8330300). Ask them to fax you the pages on XL series pulleys, and XL series belts and also the page on subfractional gearmotors and the page on set screw shaft collars. They ship by Ups often the same day and are a 100 year old supplier to American Industry You can also go to **www.mcmastercarr.com** and look at the pages in power transmission section. Endless 3/8 wide rubber XL series pitch timing belt trapezoidal tooth, rubber (e.g., mine a 120 Tooth (60 grooves p.n. 6484K222), XL Timing belt pulley 48 Tooth (e.g., mine a p.n. 6495K731), 18 Tooth (e.g., mine a p.n. 6495K717), search in their find box for AC gearmotors, go to Single Phase Subfractional HP AC gearmotors face mount (e.g., Mine a p.n. 6142K49). For shaft collars and small diameter fan blades search in their find box. You can order online.

I probably spent four hours fooling around to install my motor and pulleys and drill out my support bar. My cost to make this assembly was $37 for the motor and $35 for the belt and two pulleys..... $72 to motorize my extractor! It may sound troublesome or difficult, but once you get started its real easy. I can fix it too if it breaks down! It is a fun project as well, and I don't even have to **dread** that labor of love to hand crank extract my honey. BC

Patrick Driscoll is an engineer and hobby beekeeper in Prospect Hts., IL. He invents, and improves beekeeping equipment in his spare time.

The One-Minute Beekeeper

James E Tew

Okay, so you keep bees but most of the time you have to work them comes in short snatches. In my case, bunches of time are rare while brief snatches of time are much more common. What can I do during those tidbits of time that allows me to continue to enjoy beekeeping without getting bogged down in an all afternoon job? A few common sense tasks come to mind.

Tipping the colony

Lightly tip the colony from the back side. Heavy, or not? I can't think of many times when a light colony would be a good thing so I suspect most of the time we are hoping for a heavy one.

During Winter, a light colony can be used to predict wintering success (or failure). Winter feeding is difficult to do and will probably require you to put on supers already filled with honey. Alternatively, you can hope for a mild Winter and wish for the best.

During the Spring/Summer, the weight of a colony indicates how well the Spring flow is going, or has gone. Not much you can do about this but record-keep so you will have comparison information for next year.

Got a beehive relocation coming up this Summer? In preparation, tip the colony to see if supers should be taken off or if they can go along for the ride – or just to determine what lays ahead for your beehive move (and your back).

In general, tipping the colony is much like kicking the tires on a car. It gives you a scrap of information, makes you look authoritative and is a task that just takes a minute.

Look for signs first, then act.

Check that top super

As you come in from work, go back to the hives and pop the lid. Depending on the season, you may or may not choose to put on a veil. If you have been keeping bees for a while, I suspect you will forego lighting the smoker (an omission for which you will occasionally be sorry). I was explaining this procedure to a beginning beekeeping group many years ago. I removed the top and cracked the inner cover ever so slightly to get my information tidbit. In front of 10 new beekeepers, a hostile worker bee drilled me right between my eyes – way more information than I wanted. So, checking this top super can give you a minute's worth of information or a few moments of extreme concentration on other, more immediate matters.

During the early part of the Spring, you should tend to over super. Provide more room than they need. During the waning part of Spring or even early Summer, tend to under super so the bees will complete the honey processing procedure in supers you have already given them. Under supering doesn't mean running out of space, though. Don't forget that

Cut the grass in front of the entrance

Until I have time to get the mowing equipment out, I frequently perform a quick mini-cut in front of the hive. I don't cut so much as I just grab a handful of grass and jerk it out of the ground. It grows right back. If a statement "goes without saying," then there is probably no reason to say it, but it goes without saying that you should not grab bees in the grass that you are jerking up.

In reality, the grass in front of the hive is of little consequence so long as it is just run-of-the-mill tall grass. It is easy to pull up and gives you a quick beehive job that is easily accomplished. However, letting the hive become buried in brambles and tall weeds making them increasingly difficult to access – now that's a different story.

Sit by the entrance for one minute and observe what the bees are doing (Do this anytime bees are flying)

There are few of us who can just sit by a busy hive

entrance for one minute – in the Winter maybe – but when bees are actively flying, it mesmerizes us. Watch for:

Pollen loads – when they start, what they are collecting from, quantity, and when the bees change pollen collecting behavior.

Bee behaviors – such as robbing or nectar-laden bees returning from a foraging flight. Any deformed bees (indicating a mite problem)? Any wasps or animal pest problems at the hive entrance. Look for animal droppings and grass matted down at the hive entrance. (Probably skunks – and now you need to deal with that by getting your colony off the ground a couple of feet.)

Drones. When do you first begin to see drones? Mark it on your bee calendar. Once drones are present, you can feel comfortable raising queens or feel safe thinking that the colony could requeen itself under desperate conditions.

Look for swarms

You will probably not see all the swarms that issue from your colonies, but you will occasionally see one or two hanging about during swarm season. It may take you only a minute to look for swarms, but what if you find one? It will take you considerably longer to hive it, but the-looking-for-the-swarm part should be fairly easy.

"It only takes a minute so do it often. It'll save you hours later on."

After you keep bees in your yard for a few years, you will begin to know the places that swarms like to land. A good one minute task is to check out those spots and give a perfunctory look around the yard. Seeing no swarms, you can feel good about things and then be gone.

Crack the two deeps to look for swarm cells

You are correct when you think that this will be a very, very busy minute. If there is a good nectar flow ongoing and if it is a very gentle colony, and if it is a perfect day, you might get away with breaking the deeps apart to check for swarm cells on bottom bars, but I suspect you should light a smoker, but hey, lighting a smoker is just a one minute job, too. If you have one minute, you probably have another. So take the extra minute and fire up the smoker.

Swarm cells commonly hang from the bottom bars of frames – but not all of them. You can probably destroy most of them, but a colony can swarm with very few cells present (sometimes they will swarm with NO swarm cells present.) The primary information that you get from this quick observation is that the colony is making plans to swarm. What measures you take from that point will take longer than a minute.

Feeders make good waterers in the Summer. Check fast to make sure they stay full.

Look for Varroa *mites*

Varroa is here to stay. Just after their arrival about fifteen years ago, we dreamed that we could annihilate them, but they have been remarkably persistent. As beekeepers we have done a pretty good job of learning to live with *Varroa* in our hives, but we need to constantly keep a working estimate of our *Varroa* population. Many of you are trying to wean yourselves from hard-chemical hive use by using other, lesser forms of control. That's good, but it means that you take on

Pull out those weeds in the way every week or so.

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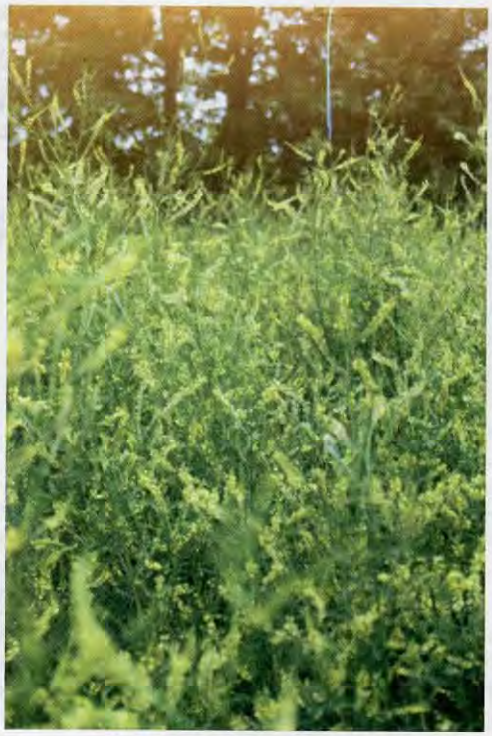

When do these bloom in your area, and how do you know?

more responsibility for the hive's welfare.

Sticky boards If you have sticky boards in place, an easy one minute task is to have a look at the mite population. You will need to decide if you are going to change the board frequently or just try to estimate the drop from the last time you viewed the board. This is just an estimate, but it helps keep you informed. You probably don't need them in for more than three days anyway – in, and out.

Screen bottom boards Many of us are using screened bottom boards on our hives. Put something under the screened bottom – maybe even a sticky board and get a quick idea of population level. If you are not using something sticky, mites may blow away when you move it if you are not careful. Again, this is just a one-minute estimate, but do this for enough minutes and you will have a pretty good idea of how well your mites are doing.

Monitor nectar and pollen sources

You have already been watching the hive entrance watching for pollen and nectar collecting activities. Now take a walk to the actual plants. They may be in bloom, but are bees actually working their blossoms. Too dry? Too cold or maybe too wet. Are there abundant bees on the floral source or just a few? Take the one-minute nectar/pollen stroll to determine how your plants are doing. Every year I complain about Honey Locust. It looks like the perfect plant for providing copious nectar flows, but every year this plant seems to have an excuse for not producing enough to provide a honey crop for my bees and me.

Got an external hive waterer?

This is a perfect one minute job – providing that you have fill ready. Either fill the feeder or take it off. Leaving it on, but empty, bees will fill the small feeder holes with propolis. Bees will take water during the warm months, but will tend to ignore them during good nectar producing times of the year.

Read a bee magazine article

This is one of my favorite one-minute jobs. I can stay abreast of bee comings and goings and most of the time, the article can be read in just a minute (or two, or three). It's good to know what others of your ilk are thinking and doing to keep beekeeping rewarding and productive. (Plus you can sit to read and not have a smoky odor on your clothes when the task is over).

I really enjoy reading old bee magazine articles. For example, I have read the July, 1948, issue of this magazine several times just to see what beekeepers were doing when I made my birth debut. Except for mites and more plastic equipment, beekeepers were doing pretty much then as today, but that is one of the reasons for keeping bees – the craftsmanship. Stay busy. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu, www2.oardc.ohio-state.edu/agnic/bee/; www2.oardc.ohio-state.edu/beelab/

Past Pieces

The First Bellowed Smoker Produced By A.I. Root

Wyatt Mangum

Important inventions are usually followed by a proliferation of different versions, exploring various potential improvements, though eventually most are discarded. Take for example barbed wire, an invention that brought profound changes to life in the American west. The original design had short wire spurs braided between two long wire strands. Patented in 1873, by Joseph F Glidden, a farmer in De Kalb, Illinois, numerous variations followed, resulting in over more than 500 patents. Even now when I hunt for cherished bits of our beekeeping history that sometimes turn up at antique shows, I occasionally see those old styles of barbed wire, avidly sought by collectors. (Yes, there are people who actually collect barbed wire.)

Though not as numerous as barbed wire patents, a similar pattern of proliferation occurred with another important innovation – the bee smoker, following its invention by Moses Quinby in that same year, 1873. Beekeepers, true to their creative nature, sought to improve the smoker by changing the original design and sometimes offering their particular versions for sale. Now for the most part, those smokers are rare, virtually forgotten pieces of our apicultural history, but they are nevertheless important in understanding how the modern smoker came to be.

Root's Simplicity Smoker

For a long time, I have had two strategies in piecing together this flowering of bee smoker diversity and its subsequent withering to essentially the standard smoker of today. One is by sifting though old beekeeping literature. In the latter part of the 1870's, beekeeping journals, books and a scattering of supply catalogs begin recording some early smokers that came into existence. The other strategy has been, and continues to be, far more difficult – that is assembling a collection of these rare smokers. The power of this plan comes in combining the literature and the smoker collection to obtain a better understanding of its history.

On the literature front, a particularly good source is A. I. Root, founder of the A. I. Root Company and originator of *Gleanings in Bee Culture* (now *Bee Culture*). By 1877, Root was selling a growing line of beekeeping supplies. His supply catalogs, usually issued more than once a year, were sometimes bound in as a supplement to the current issues of his periodical, making for an efficient distribution. The tenth edition of the catalog, bound in the April 1877 issue included the Quinby smoker, which we met in an earlier article, and the Doolittle smoker. The latter smoker consisted of a small tin tube, packed with fuel, and held in the mouth. While this smoker left both hands free to manipulate the bees, the beekeeper could easily get a painful dose of smoke in the eyes, provided the device stayed lit. Yet at least for a while apparently some beekeepers preferred the tin tubes, or mouth smokers as they were sometimes called. On the other hand, the Quinby smoker may have seemed big and unwieldy, especially, I think, if one was accustomed to a small smoking device. Also in *Gleanings in Bee Culture* that year were advertisements for Quinby smokers and Bingham smokers. Tracy. F Bingham of Abronia, Michigan, about whom we will learn more in upcoming articles, would become a big manufacturer of smokers.

So it was in this environment that Root devised his simplicity smoker, shown above, which appeared in the September 1877 issue of the *Gleanings in Bee Culture*. The article describing the smoker would be incorporated into his *ABC of Bee Culture* (now many edi-

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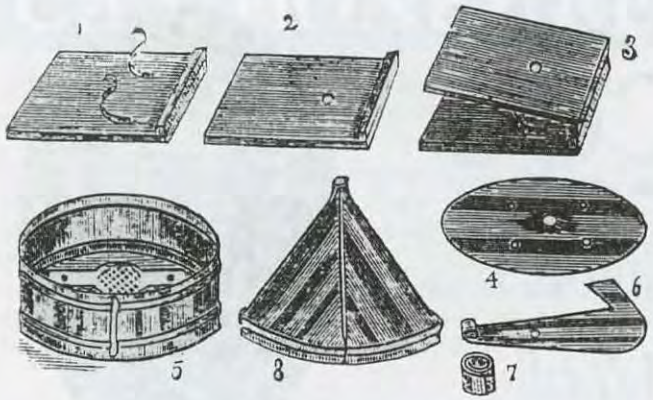


Figure 3. A pictorial parts list for the 1878 smoker. The upper picture shows the parts for the bellows, the boards and springs. The lower picture shows the metalwork, a firebox (as a can) with a grate in the bottom, a funnel, a disc, and miscellaneous.

tions later known as the *ABC and XYZ of Bee Culture*). Root was pleased with his design, especially its stability when set upon the ground, writing that "if it ever falls down, it will be higher than before." With the funnel removed, hot coals from a stove could be put in the firebox to start the fire or it could be lit with matches. He claimed sparks would not blow out of the smoker when inverted, given the funnel's shape and its small opening. In addition to irritating the bees, sparks falling in the hive engendered an additional concern. At the time, it was popular to cover the top bars with a thick quilt for wintering. Sparks falling on the quilt could smolder, starting a fire long after the beekeeper left the apiary.

The drawing also shows an interesting phenomenon – smoke rings. See them rising up from the smoker, produced, as Root described, by tapping the bellows. He thought the rings would entertain children, surely a novel smoker use. As a juvenile beekeeper, I too discovered this charming quirk in my trusty standard smoker. Watching delicate floating rings, filled with swirling smoke, seemly trapped in there, but miraculously held by nothing, definitely caught my attention. Ring making is best done in still air by gently tapping the fabric at the top of the bellows (but nevertheless keep in mind that kids should not play with bee smokers).

In December 1877, the next edition of the catalog offered the smoker for sale, introducing it with the same picture as before, but now with the caption "the smoker I prefer." As before this little catalog was bound in the current issue of *Gleanings in Bee Culture*. Root's smoker, competitively priced at 75¢, offered some middle ground between the Quinby and Doolittle smokers priced, as best as I can tell, at $1.50 and 25¢ respectively. (I couldn't find those prices in that issue, using instead those from a price list in the January 1877 issue.)

From a smoker-collecting perspective, things become very interesting in the next year, 1878. In the March issue, Root published an article titled, "How to Make a Smoker." In a time when beekeepers, as potential customers, were more inclined to make equipment for themselves, it may seem a bit perplexing that an entrepreneur and manufacturer would mass produce instructions for making his products (as Root also did for hives and extractors). Yet from his writing, one easily comes to understand that Root sincerely desired people to be happy and satisfied with their beekeeping, putting that ahead of profit, an admirable philosophy consistent with his morals, ethics and religious views.

What I found so intriguing and exciting, was that I had that smoker – in mint condition (see Figure 2). While reading the article, I checked its construction against Root's specifications. In particular, two small diagrams, showing the parts for the smoker, really

Figure 2. An A.I. Root smoker, matching in almost every detail with his 1878 article.

The smoker (funnel removed) showing the small grate. It's quite different from the modern smoker.

caught my attention (see Figure 3). The bellows not only matched in size, but also in the extra thick hinge where the boards meet. That wide hinge resulted from thick wooden cleats attached to the boards in the bellows. Although I could not see them in my smoker, Root advised using pieces of clock spring to expand the bellows. Back then, clock springs (long strips of resilient metal tightly wound up) could readily be purchased from a jeweler. Root also eliminated the complicated valve found on the original Quinby smokers. (But later, in another article, we will see that a valve on the bellows is important.)

In addition to the funnel, the metalwork consisted of a firebox with a hole in the bottom to receive air from the bellows. A metal disc was placed between the firebox and the bellows, leaving a small gap between them. This arrangement kept the wood of the bellows from scorching. The disc also had a hole in its center, allowing an air passage, and other holes for screws that went from the firebox into the bellows. Looking in the gap between the firebox and bellows, the threads of the screws were not seen because they were covered by small rolled-up pieces of metal (one of which is shown in his figure by the funnel).

Looking inside the smoker (see Figure 4), we see it's a hot-blast smoker, where the air passes through the fire (instead of around it as with a cold-blast smoker). In the firebox, the grate has small holes punched into it. Comparing the shape of the grate with the old diagram, we see it's a match. Also punching the holes in the grate formed a rough side and a smooth side (like when you punch holes in the metal top of a feeding jar). In the smoker, the rough side is up, so the little jagged edges around the holes point into the firebox. In his article, Root specified exactly this orientation. He thought the rough edges would help catch the embers, keeping them from falling out.

The main difference between the smoker in Root's article, and the smoker in my possession is the lack of a damper. The damper would have reduced the draft through the firebox, when the smoker was not in use and would have conserved its fuel. The oddly shaped metal piece in his diagram represented the damper. Fitted between the bellows and firebox, the damper pivoted from one of the screws, making it adjustable.

In the next article, we'll see Root's smoker undergo drastic changes, which might not be what you would expect. We'll even come to understand the reasons he made those changes. For comparison, you may want to keep this issue of *Bee Culture* handy as we continue exploring our beekeeping history. BC

Acknowledgments

The author thanks Suzanne Sumner for her comments on the manuscript.

Dr. Wyatt A. Mangum is a honey bee scientist, life-long beekeeper and part-time mathematics instructor at Mary Washington College, Fredericksburg, Virginia 22401-5358, wmangum@mwc.edu

COOLLLL

Stay cool, even in July!

Ann Harman

"Mad dogs and Englishmen..." and beekeepers... "go out in the midday sun." With apologies to Noel Coward's famous phrase, let's look at a subject near and dear. July is a hot month here in the U.S. – a terribly hot month. And it is a month when beekeepers think they need to do something with their bees – remove honey, check on queens, add supers, take off supers, inspect for disease, and undoubtedly do other projects. Just what are you going to do to keep from collapsing in the heat?

Actually we need to take a lesson from some of the very hot countries of the world. Unfortunately we seem to be caught up in the modern pattern of life which is really contrary to common sense. Life is sometimes a bit different in hot countries. Their work is performed in the early morning hours. Then a leisurely lunch. Then a siesta. Then work again in the cooler evening. But here, we work away in the sweltering heat of late morning, wring the sweat from our clothes and go right back at it again, complaining all the while.

Let's have a look at some of the things we can do to keep ourselves more comfortable and maybe even help stay alive.

If you can, plan your bee work to take place in the cool of the morning, read some bee magazines during the heat of the day, and return to the bees in late afternoon. And plan your work before heading out so that your time in the heat is short and well-spent.

On a day with low humidity you'll be able to stay cool easier than on a day with high humidity. Unfortunately much of the U.S. has high humidity during the Summer months. Moisture, in the form of perspiration (may I call it sweat?) evaporating from our bodies is the way our systems stay cool. Here's a quick little demonstration of cooling by evaporation of water. Take an ordinary thermometer – the sort you hang outside. Hang it outside for a while and see what the temperature is. Now throw a glass of water on it. The water does not have to be cool. In fact, the experiment works better with water the temperature of the thermometer Fan the wet thermometer with a magazine and watch what the temperature does.

Here's some ways to stay cool while working your bees. First, consider clothing. Cotton, pure cotton, is the coolest material you can wear for work during the summer. Look at the label inside of shirts and coveralls to see exactly what the fiber content is. Many synthetic fibers do not absorb sweat from the body which would allow it to evaporate. So you remain wet with sweat underneath your beesuit and your body cannot cool itself. This is not good. Particularly if you are all zipped up in coveralls, veil, boots and gloves.

Ask yourself this simple question – do I really have to wear coveralls for the hive inspections I am going to do? If most of your hives are quiet and kind, but you have one completely nasty one, requeen the nasty one so that you can work without coveralls. Many beekeepers out there work in short-sleeve shirts, no gloves, and only a simple veil. If you feel you need to be somewhat covered up, look in that pile of forgotten shirts to see if you have one that's a mostly-worn-out blue denim style with long sleeves. An almost worn-out shirt will be much cooler than a new one.

How about your helmet and veil? Ventilation for your head is important. If you have grabbed some old hat and stretched a veil on it, you may not have chosen the coolest hat. Keeping your head cool is very important in hot and especially sunny weather. Do you still wear heavy bee-proof gloves? Go ahead and try some of your tasks with no gloves. Although your hands are not as important as your head in cooling your body, you will be much more comfortable without gloves at least part of the time.

In a list of apiary site requirements, shade from deciduous trees helps the bees themselves during the hot summer months. Well, that shade helps the beekeeper, too. Try to work when the shade is on the hives, and mid to late afternoon is best. Unfortunately not all of us will be able to find an ideal site. For those in hot desert conditions an overhead slatted screen will not only help to keep the hives cooler, but the beekeeper, also.

Consider Water. You need it inside of you and outside of you. Do not ever go out into the heat and sun feeling thirsty. Your body has already started downhill. Hydrate your body by drinking water *before* you start work. Now you can keep up with water loss more easily by drinking water *as you work*. Don't wait until you feel thirsty. The bees will wait a minute while you drink some water. Portable plastic bottles are common and easy to use in the field. They don't break, they're inexpensive and refillable. Get five, or six and always have some in the truck. Keep sipping away the entire time you are working. A salty snack from time to time is also a good idea.

HEAT CRAMPS

Muscle cramps, especially in abdomen and legs
Heavy perspiration
Weakness, lightheadedness, exhaustion

First Aid
The same as for Heat Exhaustion

HEAT EXHAUSTION

Skin pale, may have heavy perspiration
Nausea, dizziness, weakness, headache
Temperature normal or low
Weak pulse
Dilated pupils
Fainting

First Aid
Get to cooler area out of sun
Remove clothing and cool body with water
Put cold compresses on head and neck area, armpits, groin
Drink small quantities of salted water (1 tsp per quart) at intervals
Do not give caffeine or alcohol drinks
Do not give medications
If no improvement, seek medical help

HEATSTROKE

(can be life-threatening)
Red, dry, very hot skin
Headache, dizziness, nausea
Pulse rapid and strong
Small pupils
Very high body temperature
Disoriented
Unconsciousness, convulsions

First Aid
Seek medical attention immediately
Put victim out of sun in cooler area
Remove clothing and immerse in very cool water or wrap in wet sheets and fan
Put cold compresses on head and neck area, armpits and groin
Do not give water or other liquids
Do not give medications of any kind

What? You find plain water boring? A small squeeze of lemon juice can make it more palatable. No sugar needed. A pinch of salt would be better. You are not making lemonade. The National Honey Board has created some drink recipes for athletes. These certainly are beneficial for beekeepers working out in the hot sun.

HONEY ORANGE THIRST QUENCHER

1/2 cup honey
1/2 teaspoon lite salt
2 cups orange juice
5-1/2 cups water

Use lukewarm water to aid in dissolving honey. Then chill.

HONEY LEMON THIRST QUENCHER

1/2 cup honey
1/2 teaspoon lite salt
1/4 cup lemon juice
7-1/2 cups water

Use lukewarm water to aid in dissolving honey. Then chill.

You are familiar with the ever-useful five-gallon white plastic bucket. Now you can get screw-on tops for these. Fill it up with cool water, add ice if you wish. Take it to the beeyard. Now you have a big supply of water for drinking and for your spray bottle. Are you fortunate enough to have a cool stream nearby? Well, in addition to your six-pack, put the bucket and spray bottle in to keep them cool.

What spray bottle? Add a clean spray bottle to your bee bucket. Fill it with water. Put it in the shade of a hive or in the creek. From time to time simply spray yourself – your neck and face, your shirt back and front, and your socks. Even if you are sweaty, a cool water spray will feel good and help to cool your body.

We are really behind the Australians in preventing sunburn and all its problems of skin cancer. They love their beaches but you will find the Aussies covered with sun block creams and wearing broad-brimmed hats when in the sun – always! Excellent, highly protective sun creams are readily available and many of them today do not wash off quickly. Find one with little or no perfume which might antagonize the bees.

Pay a visit to the sports section of your local big store. Here you will find something useful to keep yourself cool. It is like a scarf or tie that you put around your neck. The cloth tie contains a harmless substance that absorbs water. The cloth then releases the water slowly to evaporate and keep the back of your neck cool and also the arteries in your neck that go to your head. Ask for a Kool Tie®, get it wet and use it. Even a bandana that's wet, when loosely tied around your neck will help a lot. Rewet everytime you stop for a drink.

It is wise to let someone know where you are going. Give them at least a rough idea of how long you will be. Just being hot from working is one thing, but collapsing from the heat requires immediate help.

Common sense dictates if you start feeling woozy or ill, it is time to stop work and take steps to recover. Do not even think of returning to the bee yard that day. Ask yourself if you took proper precautions against overheating. Then modify your schedule so that you do not repeat that situation.

Perhaps you need to stop and sit in the shade, or in the creek, for 10 minutes in between working each hive. Perhaps you should have listened to the weather forecast and paid attention when the high temperature for the day was announced. Perhaps those bees really don't need your attention today.

We've listed information about the three categories of health problems caused by excessive heat and our body's inability to cope with overheating. Note them carefully and do not let them happen. *Keep yourself cool.*

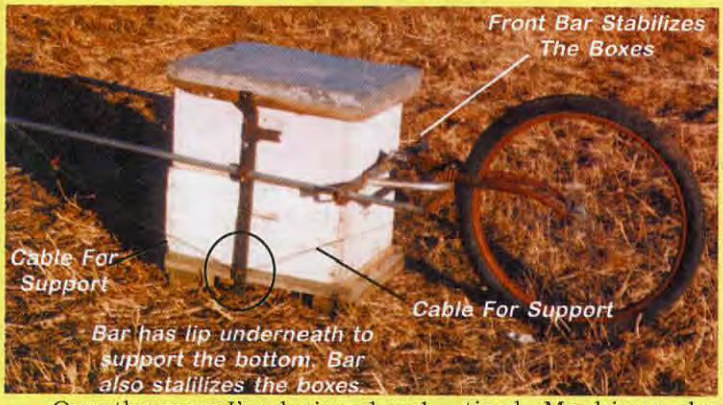
Of course, the ultimate cooling is fairly easy. Turn on the garden hose and douse yourself thoroughly from top to bottom. Squelch your way out to the beeyard. BC

Ann Harman is a cool beekeeper from Flint Hill, VA.

Easy Does It!

A Better Barrow

Lee Messersmith



Over the years I've designed and constructed many pieces of equipment to handle beehives and honey. All of this equipment has reduced the hard physical labor involved in beekeeping. Mechanical energy and the application of laws of physics can enable any person to handle weight that muscle alone cannot handle and machines do not get tired. Machines should speed up production. But, even the best built and designed machines do wear out and break down, operators need to be almost as smart as the machine and much of this machinery was too slow when compared to young strong men who have helped me. Many workers were strong and eager to build up (and maybe even show off) their muscles. I've been blessed with wonderful helpers.

Several hive wheelbarrows survived a few years helping to move and load bees and honey. This one has survived and is still in use. It is light weight. Cables are used in place of heavy metal or wood for the strength. Ease of operation. It can be lifted into position or the handles are spread and rolled into position in front of or behind the hive, close the handles, lift and move the hive. The large pneumatic bicycle tire rolls easily up ramps or over any terrain.

We've had to move yards to please landowners, to run from aerial and ground spraying for grasshoppers and other pests and to try out promising locations. Our whellbarrow has always made any move easier.

Burn Better

Harley Crawford

I have been a hobby beekeeper for many years and belong to the Sonoma County Beekeepers Association in Santa Rosa, CA. Several months ago, one of our members gave a nice program at our club and at the end waved a piece of cardboard and said that cardboard made the best fuel for smokers. I have never used cardboard and have never read about it in any publication. I thought that this would be a good subject for me to investigate. All my experiments were made using single weight cardboard, cut to four inches wide. You can use any width that suits your needs. A table saw does a fast job of ripping the cardboard. Be sure the corrugations run *across* the narrow part of the strips. An 1885 Fairbanks Postal Scale and a 1893 washing machine wringer were used in the tests. All figures are approximate except the weight.

First I took just plain dry cardboard rolled up to fit into a smoker. **Weight**: 4½ oz. **Length** 6½ inches and **Burn Time** 1 hour.

With the next test, I put the dry cardboard through the wringer and crushed the corrugations to slow the flow of air and slow down the rate of burning. **Weight** 9 oz. **Length** 13 inches and **Burn Time** 5 hours.

Next, I submerged the cardboard strips in water for one minute or until the bubbles stop coming to the surface. Then, shake the water out, and roll the wet strips up using a 5/8 inch rod to form a hole in the center. In the Summer when the temperatures are 80° to 90° these will dry in the sun in about a week. Push hard when rolling to collapse the corrugations. If you can't push hard, lay strips out and go over them with a rolling pin. In Winter they can be dried indoors over lamps, stoves, or heat vents. *NO* microwaves, mine burned. **Weight** 9½ oz. **Length** 12 inches and **Burn Time** 6 hours.

Another technique involves following the instructions given above, except after dipping strips in water, put cardboard through washing machine wringer to smash corrugations. Now roll up with the rod in the center. **Weight** 12½ oz. **Length** 18 inches and **Burn Time** 7 hours.

To light your smoker using the cardboard, cut a triangle piece of cardboard two inches long and one inch wide and force it into the hole in the center. Now light and let burn for a moment. Then place in the smoker, close the lid and happy smoking.

When finished with the smoker, put a plug in the exit hole and lay on side. It will go out. To use again, light as before.

After the rolls are totally dry, be sure to store them in an air tight bag (plastic) so they won't absorb moisture from the air.

?DO YOU KNOW?

Revisiting Basic Physiology

Clarence Collison
Mississippi State University

Knowledge about basic bee biology is important in determining the requirements and conditions needed for colony survival and what management manipulations are needed in order to have productive hives. In its general form, the honey bee resembles any other insect, however, since the bee leads a highly specialized kind of life, it has numerous modified structures that allows it to live this life style. Communication and regulation of activities by pheromones in the colony is of primary importance to its success. To understand basic bee physiology and behavior will aid the beekeeper in making the right management decisions most of the time.

Please take a few minutes and answer the following questions to determine how well you understand bee biology and behavior.

The first ten questions are true and false. Place a T in front of the statement if entirely true and an F if any part of the statement is incorrect. Each question is worth 1 point, unless otherwise indicated.

1. ____ Malpighian tubules are small tubular structures which extend throughout the abdominal cavity and they are involved in adding digested nutrients to the blood.
2. ____ The ocelli or simple eyes of the honey bee can analyze polarized light, thus permitting the bee to use the sun's position as a compass during flight.
3. ____ Drones produce pheromones in their mandibular glands that are attractive to other drones on mating flights.
4. ____ Foragers have more juvenile hormone than young house bees.
5. ____ The presence of brood pheromones stimulates nectar and pollen foraging in a colony.
6. ____ The honey bee queen's spermatheca is well supplied with tracheation which furnishes the cells with oxygen and carries of gases and water vapors.
7 ____ Salivary glands are found in the worker's head and thorax.
8. ____ Dandelion pollen is deficient in several amino acids that are required for honey bee development.
9. ____ The queen honey bee only stores a small fraction of the semen that she receives during her mating flight.
10. ____ Because of kin recognition within the honey bee colony, reproductive favoritism occurs within subfamilies.

(Multiple Choice Questions, 1 point each)

11. The shaft of the honey bee stinger appears to be a solid structure, however, it is composed of ____ separate pieces.
    A. Three
    B. Five
    C. Two
    D. Four
    E. Six
12. ____ The gland that produces queen substance in queen honey bees is associated with the:
    A. Dorsal surface of the abdomen
    B. Tarsal foot pads
    C. Sting chamber
    D. Mandibles
    E. Ventral surface of the abdomen
13. Honey bee development and survival requires ____ essential amino acids in their diet.
    A. Five
    B. Eight
    C. Seventeen
    D. Seven
    E. Ten
14. Drones are attracted to queens and can detect queen mandibular gland pheromones from a distance as far as _____:
    A. 100 meters
    B. 60 meters
    C. 10 meters
    D. 200 meters
    E. 30 meters
15. Name three functions for the worker's mandibles. (3 points)
16. Name three ways that saliva, the secretion of the labial or salivary glands is used by the bee. (3 points)
17 Name two factors that regulate the development of wax glands in the honey bee. (2 points).
18. Name three senses associated with the antennae. (3 points)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1 **False** The Malpighian tubules are not digestive glands but excretory organs that remove waste products of metabolism from the blood, including both nitrogenous substances and salts. These waste products are discharged into the intestine and are eliminated along with the waste food matter.

2 **False** The compound eye, not ocellus or simple eye, can analyze polarized light, thus permitting the bee to use the sun's position as a compass during flight. A simple eye has one lens for the entire retina, thus is unable to form perception images.

3 **True** For many years it was believed that drones did not produce any pheromones. However, recent research has shown that drones apparently produce pheromones in their mandibular glands that are attractive to other drones on mating flights.

4. **True** As honey bees age they graduate from simple to more complex tasks. The first thing that an emerging bee does is clean cells. This is apparently the simplest task. She then becomes a nurse bee, feeding the young. Soon thereafter she may undertake other activities such as removing the dead, processing nectar into honey, controlling temperature and humidity, etc. Finally, a worker becomes a forager, the most difficult and dangerous task. How fast a bee moves from one activity to another is controlled by a hormone called juvenile hormone. Foragers have more juvenile hormone than young bees.

5. **False** Pollen foraging is stimulated by brood pheromones of developing larvae and a lack of adequate pollen stores. Nectar foraging is stimulated by high sugar concentrations. Brood pheromones have no effect on the number of nectar foragers.

6. **True** The manner in which the spermatozoa are nourished and kept alive in the spermatheca of the queen for several years is one of the marvels of bee physiology. The spermatheca is well supplied with tracheation which furnishes the cells with oxygen and carries off gases and water vapors.

7 **True** Saliva is secreted by two pair of glands discharging into one median duct. The glands of one pair lie in the back of the head, those of the other pair in the ventral part of the thorax.

8. **True** Dandelion pollen has been found to be deficient in tryptophane, arginine, and phenylalanine which are essential amino acids for bees. Newly emerged honey bees held in cages are unable to rear brood when fed pure dandelion pollen diets.

9. **True** The queen normally stores five to six million sperm in her spermatheca, the sperm storage organ. Mating with 10 to 20 drones, she may collect up to 200 million sperm in her oviducts. Most of the semen, about 90%, is discarded and expelled as a dry discharge. Mating with numerous drones, the queen stores only a small fraction of the semen collected from a mix of each drone she mated with. The transfer and storage of sperm from different drones is not equal.

10. **True** Within the honey bee colony, there is kin recognition among the different subfamilies. Research has shown that reproductive favoritism occurs within subfamilies. Workers rearing a queen will choose a larva that is more closely related to itself. Nurse bees also take better of full sisters in comparison to half sisters.

11. A) Three

12. D) Mandibles

13. E) Ten

14. B) 60 meters

15. Collecting and eating pollen
Manipulating wax and building comb
Cleaning the hive, picking up debris
Fighting enemies of the hive
Gathering and working propolis
To support the proboscis

16. Saliva is used to:
dissolve or dilute sugary foods (dry sugar or granulated honey)
clean surfaces (brood cells or the body of the queen)
moisten substances being chewed

17 Age of the honey bee
Amount of nectar or honey in the honey stomach
Need for comb

18. Touch, Taste, Smell

There were a possible 25 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
25-18 Excellent
17-15 Good
14-12 Fair

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

those queen-like bees, just in case. And then he called me. And I called the USDA people who deal with these things and they seemed to think they had an idea of what it could be. But until they had a chance to look at the bees they weren't going to say. Meanwhile, I have a friend who has had some experience with this sort of thing, which surprised me, and his thoughts were that this sounded like behavior that a swarm of African bees would exhibit. Can you believe that? Well, I could hardly. This isn't Texas, or Arizona for goodness sake. Or California either. But it turns out maybe that's where the queen came from that threw the swarm. Well, this will be interesting to watch, so I'll keep you informed. Can you imagine how cold they must have been all winter?

Speaking of California, I recall how fond you were of that fair state, and I know you don't like me referring to it as the land of fruits and nuts, but I heard just a couple weeks ago that some of those out there in the business of packing honey from China had a run in with the good-food people from our federal government and California's government. It seems that there's a lot of honey that was produced in China that had some illegal chemical in it an antibiotic - and they figured out that if they filtered it absolutely to death they could get that stuff out. Well, it worked. But everything else was filtered out too. In fact, those in the know decided that it wasn't even honey any more. Just a sweetener made from honey. Well, you can't call that stuff honey when you sell it, and it seems some were trying to do just that, so the authorities clamped down on that activity right away and locked some of it up, I understand. I don't know yet if this is a criminal act, but it seems like it should be. I know you had a thing for people selling junk that wasn't honey, and calling it honey. Times haven't changed much, have they?

Well here's something you didn't encounter when you were around. It's those darned genetically modified plants we have now. What we don't know, or know well enough, is, is what they put in those plants (genes from somewhere else that make them tolerant of herbicides, or death to certain insects that try and eat them), affecting the pollen and nectar that the plants produce? This is as clear as mud at the moment, and meanwhile, canola, soybeans and cotton are producing nectar like mad, and bees are making honey from it.

The powers that be have decided these plants can't be considered when considering organic food production, so what does that mean for honey that is made from these plants? Well, I don't know. It sure is a mess down here right now.

Speaking of honey, the National Honey Board has itself in another fine fix. About the time you get this there will be another referendum on whether the beekeepers and the importers want to keep the Honey Board they have now, or vote it out of existence. You've noticed, I'm sure, that other groups have had similar experiences - mushrooms, apples, and other crops. Getting to this point has been a real battle with beekeepers, importers, and packers all shouting and yelling, trying to get heard and throwing things at each other. But sometimes, it's how many people you know, and the Honey Producers know enough people to make it come to a vote. Right now, it seems as certain as Sunday Church that the vote will disband the Board. But we both know that only two things are certain, so we'll see. If it does go against the standing Board, there's another group waiting in the wings to take over much of the activity that was going on. But these folks are the packers and importers. The producers won't have much, if any say in what they do. But then, it's not their money anymore, so how it gets spent isn't their business anymore.

It will be interesting to see if those who benefit most from any increased sales will be willing to pay the freight of running a Board. It will be even more interesting to see if they can get along well enough to make it work. If you have any influence up there, you might try and convince someone to give a hand. This group is going to need all the help they can find.

The weather here has been less than tolerable, as you know. Isn't there something you can do to turn off the faucet up there? Last year there wasn't enough, but making all of it fall at the same time this year seems a bit extreme, don't you think? See what you can do, will you please?

Your Company, and your magazine are still making do. Lots and lots of candles here, but you knew that. You wouldn't recognize your magazine anymore, but we try to do the same things you used to do ... and that's keep people informed of what's going on, and all the tricks of the trade for being a better beekeeper If you have some suggestions on how we could do this better, we're all ears you know.

So, I guess that's it for the news right now. John, Stu, Brad and all the gang say hi, and we all hope things are fine where you are, and that you have a truly wonderful holiday. Say hello to all the beekeepers up there for us. And God Bless.

Your friend,

GLEANINGS

JULY, 2003 • ALL THE NEWS THAT FITS

From The U.S. To Canada
Illegal Queens Confiscated Beekeepers Charged With Smuggling

An Alberta beekeeper was hit with a $5,000 fine for importing honey bees from the U.S. Jouwert DeJong, a Brooks apiarist, pleaded guilty to the charge in a Lethbridge courtroom April 17. DeJong, a Canadian resident since 1974, was lectured by judge Timothy Hironaka for blatantly flouting the law that has prohibited, since 1987, bee imports from the U.S. mainland for fear its less stringent regulations may allow diseased American insects into Canada. Hawaiian bees are exempt from the ban.

"I'm bound by the legislation, you're bound by the legislation," Hironaka told DeJong. "If you disagree with the law, you may exert effort to have the law changed through elected officials. Your avenue is to use the political process." DeJong, 51, did not declare the 250 queen bees in his truck at the Carway border crossing near Cardston on May 23, 2002. The bees – at $j9.50 per bee, worth more than $2,300US – were found when his vehicle was searched. Not only was DeJong aware of the importation

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AIRBORNE! Heartland Apicultural Society Takes Off

Near my home there is a pond frequented by geese. I'm always impressed by their take off procedure. It involves a lot of honking and flapping, until finally these big birds manage to clear the water. Eventually they are off, and assort themselves into their graceful "V"

Many of us in Kentucky and nearby states have been working for the past two years to form a regional beekeeping society. After a considerable amount of honking and flapping, we've made some real progress upward. We hope to be as successful as the Eastern Apicultural Society (EAS) and the Western Apicultural Society (WAS). Since we are geographically somewhere in between we are calling ourselves the Heartland Apicultural Society (HAS). Like the EAS and the WAS we are emphasizing education, primarily through annual conferences.

Our first conference, at Goshen College in northern Indiana, was a strong start with 47 different presentations on practical aspects of beekeeping. We registered 195 people from 11 states plus Mexico and Canada. Some of the best vendors in the U.S. and Canada displayed an impressive array of beekeeping equipment and books.

The second HAS conference will be July 10-12, 2003 at Midway College. This is in the town of Midway between Frankfort and Lexington, Kentucky. Our website www.heartlandbees.com includes directions, a map, a list of speakers and topics, lodging, and other useful information. We will have presentations for beginning and experienced beekeepers. Registration begins May 1, with a form and details on the website. Those without internet access should feel free to contact me at (502) 597-6351 or Atwood Research Facility, Kentucky State University, Frankfort KY 40601.

HONEY BOARD'S FUTURE TO BE DECIDED, AGAIN

The U.S. Depart of Agriculture announced today that honey producers and importers have submitted enough valid names on a petition requesting the USDA hold a referendum on the National Honey Board.

The American Honey Producers Association filed the petition February 10, 2003 requesting a referendum to determine whether honey producers and importers favor continuing the Honey Research, Promotion, and Consumer Information Order – the last such referendum was conducted in 2002. According to the USDA press release, a total of 388 valid petition names were received, exceeding the 308 minimum (10 percent of the total number of eligible voters) required for the petition to be accepted by the USDA.

For the Order to continue, it must be supported in a referendum by a majority of the voters who represent 50 percent or more of the honey or honey products represented by the voters in the referendum. The USDA will announce the dates and location of the referendum soon.

Further inquiries regarding this matter should be made to Kathie M. Birdsell, AMS Fruit and Vegetable Programs, USDA Stop 0244, 1400 Independence Ave. SW, Washington DC 20250-0244, 888.720.9917 or fax 202.205.2800.

The National Honey Board is an industry-funded research and promotion board designed to increase the demand for honey and honey products in the marketplace.

Mislabeling Expensive Honey
NEW ZEALAND CHASING CROOKS

Some New Zealand honey producers are mislabeling their product as therapeutic Manuka honey so they can charge three and four times the price of regular honey.

Airborne Honey Ltd, managing director Peter Bray, who has conducted a long-term campaign against dishonest labeling practices, said regulations are essential to enforce standards on selling New Zealand honey varieties.

The mislabeling, he said, is also occurring with other higher priced native varieties.

He would not name the brands involved.

Some producers heat-treated clover honey, he said, to give it the dark manuka look.

He said mislabeling lower priced honey as a sought after variety to get a higher price isn't new but a jump in the price of honey harvested from the native Manuka tree in the last year because of supply, shortages has increased the incentive to cheat.

"Manuka honey has been, in the last year or so, far in excess of the price of normal everyday honeys in New Zealand by a factor of three and sometimes fourfold," he said.

In recent years the manuka honey price has jumped from around NZ$6 a kilogram to as high as NZ$15.

This has resulted in increasing mislabeling.

"There are no effective regulations to prevent this in the marketplace at the moment, although there are international standards for various types of honey and there are various ways of determining the origin of a particular honey type."

He said the mislabeling succeeds because the regulatory

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ILLEGAL QUEENS ... Cont. From Pg. 57

ban, it wasn't the first time he had smuggled bees over the border, said Crown prosecutor Greg Maxwell. Subsequent searches of DeJong's office and that of his accountant showed DeJong was a busy bee when it came to smuggling the critters.

DeJong, owner of DeJong Honey Farms, was charged with five counts of bee trafficking back to April 2001, and his company with five identical counts. In the end, he pleaded guilty to one count; the remaining nine were withdrawn.

DeJong's bee plot involved having the insects shipped UPS overnight from California to Kalispell, MT, where he picked them up from a post office box for the trip to Brooks. Maxwell indicated DeJong, who co-operated fully with the subsequent investigation and entered a timely guilty plea, believes the law is flawed and took steps to conceal the bees at the border.

The fine will no doubt please law-abiding beekeepers throughout. Alberta who have suggested bee smuggling is a hive of activity. They claim so many bees have been brought illegally into the province from the U.S. over the past several years that smuggling the bugs has become an Alberta institution. Still, until Thursday, Canadian Food Inspection Agency officials often cited lack of proof. "There are consistent allegations there is smuggling across Alberta," agency veterinarian Brian Jamieson said recently. "But we have never been presented with substantial information that will allow our compliance people do their jobs.

"Most legitimate keepers bring in queens from New Zealand and Australia, as well as Hawaii. They're legal because these countries and Hawaii are said to have stricter bee healthy plans than mainland U.S. The fertile female queens are needed to propagate the hives in Spring.

DeJong is not alone in his opposition to the law. Mark Winston, a scientist and bee expert at Simon Fraser University in Vancouver, said Alberta apiarists have waged a lengthy battle against the federal government regulation. But, as Hironaka warned DeJong on Thursday, keepers can't just bumble over the border a la Prairie wheat farmers versus the Canadian Wheat Board. "There is no constitutional argument here," said the judge. "Our concern is not whether this is good or bad legislation." But many keepers believe the law is far from the bee's knees. They point out the health concerns that blacklist American bees are already prevalent in Alberta, making the ban moot. The industry is worth about $15 million a year in the province.

In a related incident in late May, Canadian Border officials confiscated over 8,000 queens entering British Columbia from the U.S. at the Osoyoos crossing, valued at $100,000.

The Canadian driving the horse trailer containing the battery boxes was apprehended and indictments are expected. The queens originated from California and Georgia in the U.S.

After being confiscated, the queens and attendants were destroyed.

from Hivelights

New Zealand Still Looking
KILLING *VARROA* CARRYING BEES

A new bee bait that kills all bees in an area has been developed in New Zealand's fight to prevent the spread of *Varroa* through the South Island.

"Our findings indicate that it may be possible to eradicate the *Varroa* mite when it arrives in the South Island by using the bait to poison and kill *Varroa*-infested feral bees," said Mark Goodwin, who lead the Hortresearch organization team that developed the bait.

The team has completed a large-scale test using 20 honey bee colonies and nine bait stations containing sugar syrup and a toxic substance that were placed throughout a 990-acre square grid.

Although it was planned that the baiting would be carried out over six weeks all colonies were killed after one day of poisoning.

"These results indicate that eradication is technically feasible, but there are several other factors to be considered, most important being how far *Varroa* may have already spread," Goodwin said.

Alan Harman

MISLABELING ... Cont. From Pg. 57

authorities are not using the tests available to verify the origins and make-up of honey.

Bray said major honey marketers 18 months ago agreed on national standards and he wants them backed up by regulations that can be enforced in the same way the wine industry does.

"There have been prosecutions for people passing off one type of wine from a specific variety of grape as something that it is not, and I think the same should be occurring in the honey industry," he said.

"Those people that have blatantly put product that isn't what it says into the marketplace, then they would get a wake-up call and there would be a significant improvement in the quality of the product in the marketplace."

Bray said there are tests that accurately identified honey.

"We take a number of what we call key parameter profiles which we know are a very narrow range for a particular honey type. Some of these are very simple methods.

"For example for Manuka honey we use color, we use conductivity – the amount of electricity that the honey will conduct.

"We measure the pollen content of the honey and identify the different species of pollen that are in the honey.

He also takes a number of other measurements including a measure of sugar ratios.

Gray said the national standards proposal was sent to the National Beekeepers Association but nothing happened.

The country's Food Safety Authority is developing a management program and code of practice for the honey industry but this will not cover labeling of honey varieties.

This is to help beekeepers meet the requirements of the Animal Products Act which focuses on food safety. It will cover such items as chemical residues and the labeling requirements won't cover the floral source of honey.

When Bray aired his complaints in a local radio interview there was some quick stepping by various government bodies.

A spokesman for the authority said floral source labeling would come under the Fair Trading Act administered by the Commerce Commission.

Bur a spokesman for the Commission said it does not make rules or set policy and the labeling issue should be addressed by the Economic Development Industry or Standards New Zealand.

Still, it then decided to look at whether it should investigate Bray's complaint and a decision would be made shortly.

Alan Harman

2003 4-H ESSAY WINNER

Extensive research and concise writing won the 2003 4-H Beekeeping Essay Contest for Shannon Grant of Rathdrum, ID, sponsored by the Foundation for the Preservation of Honey Bees.

Shannon covered beekeeping from stingless bees in pre-Colonial Mexico to Bermuda to late imports into western America.

Shannon has been in 4-H for 10 years in a variety of projects. A high school senior, she plans to attend the Univ. of ID. For her essay, she is awarded $250 cash.

Aaron Christian, 16, of Salem, AL, is the second place essayist. "Even though not native to the New World," he wrote, "the honey bee quickly became an integral part of the agrarian colonial society." The 2nd place prize is $100.

Courtney Poland, a freshman at Sterling (KS) College turned in the third place essay and receives $50. In her paper, she included the replacement of the original black German bees by the yellow Italians and introduction of honey bees to the Hawaiian Islands.

In addition to the national prizes, four essayists were awarded honorable mention: Patrick McFayden of Starkville, MS; Louis Sharpnack of Chardon, OH; Teresa Smith of Belleville, IL; and Lauren Brooke Jarboe of Oroville, CA.

The topic for 2004 is "Swarming." Every beekeeper can relate a tale of an unusual swarm. What are the reasons for swarming? What does swarming accomplish for the bees? What is the effect on the beekeeper? One humorous or interesting swarming incident is a welcome addition to the essay.

Students interested in writing should contact their local 4-H offices for contest details.

BUMBLEBEE SHORTAGE

A campaign has been launched to save some of the most important pollinators in British gardens native bumblebees.

Conservation charity the National Trust and government wildlife adviser English Nature are urging Britain's gardeners to help save the native bumblebees.

The bumblebees are vital pollinators of flowers, soft fruit and certain crops such as runner beans, and are able to pollinate at lower temperatures than most insects.

There now are 21 native bumblebee species and six varieties of cuckoo bees bees that dupe other bumblebees into looking after their young.

Of these, six bumblebees remain widespread, while five are in serious decline with the Large Garden bumblebee, *Bombus ruderatus*, on the verge of extinction.

Two species are extinct. Cullem's bumblebee, *Bombus collamanus*, was last seen in 1941 and the short-haired bumblebee, *Bombus subterraneus*, has not been seen since 1999.

The Great yellow bumblebee, *Bombus distinguendus* is extinct in England and since 1950 its numbers have declined by 50% in Scotland.

There has been a 95% decline in numbers of both the Shrill carder bee, *Bombus silvarum*, and the Large garden bumblebee in England since 1960.

The numbers of the Humble carder bee, *Bombus humilis*, has dropped by 50% in England since 1950.

The National Trust and English Nature said intensive agricultural practices and a decrease in the number of insect pollinated crops have led to the drastic decline in bumblebee numbers over the past 70 years.

The decline in bumblebees has been measured only for a few very rare species but it is clear from surveys that even the currently most abundant species have suffered declines of similar proportions.

As a result, gardens now are becoming increasingly important refuges for bumblebees and the two organizations said gardeners have a vital role to play in creating the right habitat to help these bees survive.

"Without wild bees our gardens would be sterile places but we do not always give enough thought to how we manage our gardens to encourage these beneficial insects." National Trust director-general Fiona Reynolds said.

The first thing they want gardeners to realize is that they are mistaken in thinking that all flowers are beneficial to bees. Many modern hybrids are sterile and lack the pollen and nectar that are vital for the survival of the native insects.

Unlike the honey bee, bumblebee colonies store only a few days' worth of energy reserves and so are much more vulnerable to food shortages when flowers become scarce.

The native bumblebees build nests in the ground and English Nature said the nests are used for only one year.

Good plants for bumblebees are often white, blue, purple or yellow because bees see ultraviolet colors and make a beeline straight for them.

Alan Harman

EXPORT $$$ AWARDED

Ag Secretary Ann Veneman announced fiscal year 2003 allocations of $110 million to 65 U.S. trade organizations to promote U.S. agricultural products overseas under the Market Access Program (MAP). The 2002 Farm Bill provides for increases to MAP, more than doubling funding to $200 million annually by 2006, the first increases since 1996.

"Increased trade opportunities for American agriculture products benefit not only the food and agriculture sectors, but the economy as a whole," said Veneman. "The Market Access Program helps promote U.S. products and build new markets overseas."

Veneman said exports are expected to reach $56 billion this year, which support 840,000 jobs, and for every $1 billion more, 15,000 new jobs are created.

Big gainers were Amer. Forest & Paper $6 million; Mid Am. International Agri-Trade Council $6 million; Western U.S. Ag. Trade Assn. $6.6 million; Wine Institute $3.8 million. The National Honey Board generated $131,000 for export enhancement

For information on the program, call the FAS Marketing Operations Staff at 202.720.4327 or visit the FAS Web site at www.fas.usda.gov/mos/programs/mapprog.html.

Meanwhile, The Import Debate Goes On

PROTOCOLS FOR QUEEN IMPORTATION

This is an abridged version of the full report which is available on the Canadian Honey Council website, www.honeycouncil.ca/importb.html.

1. The queens must originate from an apiary free of genes of the sub Saharan type of the Africanized honey bee, *Apis mellifera scutellata* as determined by nuclear DNA or allozyme testing by an accredited laboratory on a random sample of workers representing progeny of the breeder queens.
2. Africanized honey bees must not have been detected within 100 miles (160 km) of the locations of the apiaries of queens' origin within the past two years.
3. The queens must originate from an apiary that does not have any visible clinical evidence of American Foulbrood (AFB), European Foulbrood (EFB), *Varroa* mites or Small Hive Beetles.
4. Queens will be shipped in battery packs.
5. After arrival at the Canadian quarantine facility all attendant worker bees will be removed from the battery boxes and killed.
6. Attendant worker bees will be tested for *Varroa* mites and examined for Small Hive Beetle.
7. Clean local attendant worker bees will be added to the battery packs.
8. Queens inspected and meeting all requirements will be released from quarantine for shipment to final destinations.
9. Any queens that fail to meet the requirements will be destroyed.
10. All destroyed bees will be incinerated.

Submitted by Medhat Nasr
Provincial Apiculturist Alberta

Contaminated Honey From Australia?

HONEY POLITICS GETS NASTY

Australian Agriculture Minister Warren Truss denied claims that contaminated Chinese honey is being imported into Australia, relabeled as Australian product, and then shipped to the U.S.

The claims were made by opposition Labor Party Senator Kerry O'Brien.

"Hollow, unsubstantiated claims of an 'ongoing' and clandestine 'honey laundering' trade are not only damaging to the Australian honey industry but also to our international trading reputation," Truss said. "I urge the senator to retract his scare mongering comments immediately.

"O'Brien makes a habit of issuing media releases which pay scant attention to the facts and, in this case, he could seriously undermine the export efforts of a group of primary producers already battling the effects of drought and fire."

Truss said the Australian Quarantine Inspection Service carries out surveillance testing of all imported honey for chloramphenicol and pesticide contamination and any product failing the testing is not allowed to enter Australia.

"Chloramphenicol is not registered for use in food production in Australia, including in honey production," he said.

Australian authorities last year became aware of a shipment of Chinese honey transhipped via Australia to the U.S. that was illegally labeled Product of Australia, apparently in an attempt to evade U.S. anti-dumping penalties on Chinese honey.

AQIS and the Australian Customs Service worked closely with the U.S. Customs Service in uncovering the incident.

"Claims by O'Brien that the government failed to act on the issue are false," Truss said.

The government responded decisively and has kept the honey industry and Parliament informed, he said.

"If O'Brien has evidence to substantiate his claims that 'honey laundering on an unknown scale' is 'ongoing' he should provide it immediately to AQIS so investigations can commence."

Alan Harman

Display Advertisers

In Your Ear

Ed Colby

Back in April, the wind howled as we worked the honey bees at the Wallace Creek gravel pit. In an offhand way, Paul said, "There's a bee trying to get in my ear. She probably just wants to get warm."

Paul has shaggy ears, so I can understand how they might look like a refuge from the storm. Bees somehow get inside our veils all the time, but Paul never ripped his off to shoo that bee away. He never stopped working. He merely remarked.

He continued: "A bee could get stuck in your ear. You might have to get somebody to get her out with forceps." Paul loves to talk like this.

I had a honey bee up my nose once, but a bee inside my ear sounded downright distracting. "You're giving me the creeps," I said.

"Maybe the bee would crawl right inside your head," Paul said with a wry smile.

"She wouldn't get past my eardrum," I said.

Paul said, "A bee couldn't sting your eardrum, because she'd have to back in to do it."

I said, "Who mentioned anything about eardrums getting stung? I think any sting inside your ear would really light you up. You know, I'd wear ear plugs, but I can't hear that well even without them."

Paul said, "I think you have better things to worry about."

Back in the truck, Derrick turned up the radio. He said, "This song really gets to me. Have you seen the video?"

I said, "No. I also can't make out the words."

Derrick said, "It's about this woman who kills her little girl."

"You're kidding," I said.

Derrick said, "First the girl hides her bruises at school. Then she ends up at the cemetery. You should see the country video."

"I'd rather not," I said.

Just then I thought I caught some of the words. I said, "'Name on a polished stone?' Did I hear that?" Derrick said, "Yeah, 'name on a polished stone.' That's her gravestone."

Derrick, who is 21, recently came back to work for Paul after a couple of years away. He rhapsodizes about how this job is better than his last one, managing a shoe store. I concur. You couldn't ask for a better job.

Paul drives the truck. At first Derrick sat in the middle, out of deference to my advanced age, I suppose. But as soon as I made it clear that we're all equals, bro, he kind of seized on the shotgun position. With the window down, he can smoke. You really can't smoke in the middle.

In the shop the next day I said, "Derrick, the name of that song is 'Stone Baby,' right?"

Derrick gave me a look. "'Concrete Angel,'" he said.

"Concrete Angel and Stone Baby kind of sound the same to me," I said. Derrick shook his head. Didn't I know anything? Paul chuckled at our morning banter as he headed out the door.

Just when I think I have all my friends convinced that I'm some kind of saint for keeping bees, somebody rains on my parade. The latest: Robin says she won't buy my honey anymore. I asked why.

"It's because you smoke the bees out, Ed," she said. "All you beekeepers do. I can't go along with that."

I said, "Robin, what are you talking about?"

She said, "You smoke out the bees to kill them so you can get their honey."

I said, "We give the little darlings a puff or two to pacify them. Who ever told you otherwise? "

She said, "It's in some information I got from an environmental group."

I said, "Robin, who do you believe? Me or somebody you don't even know? Did it ever occur to you that whoever wrote that maybe has no idea what he's talking about?"

She said, "Ed, I'll bring you the information. I'm pretty sure you kill those bees to get their honey. That's why I can't buy any."

At least my good customer Gail from the garden club thinks I'm some kind of saint. When she invited me to speak on honey bees at the club's August meeting, she indicated that the club customarily paid an honorarium. How much would I require?

When I threw her a number, she said, "My, that's about double what we customarily pay."

I said, "Well, you asked. I figure with research, rehearsal, driving time, plus a two-hour meeting, that's a bargain. I understand that the club is your volunteer work, but it's not mine. I appreciate the good you do, and I appreciate the opportunity to preach about honey bees, but Gail, I need a fair remuneration. I'm worth it."

I'll sell my talk the same way I sell honey. I'm going to charge whatever the market will bear.

She seemed to comprehend my point of view and said she'd float my proposal. The club president, Gail apparently has some pull. When she called back, she said the talk was a go, even at my "rather steep fee." I promised not to disappoint her.

In my talk I plan to include a discussion of the theory and practice of smoking out the bees.

Even though I dreamed we won $3 billion in the lottery, the reality is that Linda and I will never be rich. Still, we both love what we do. We have our health (knock on wood). We have Spot. We have the bees. The universe looks OK from here.

Everything will be just fine, as long as a bee doesn't crawl inside my ear.

BOTTOM BOARD