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Edible Flowers 45
Mobile Bees 41

Bee Culture

JUN 2002

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Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

JUNE 2002 VOLUME 130 NUMBER 6

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A Tiger Tail Queen, up close and personal.
photo by David Green

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KEEP IN TOUCH

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MAILBOX

More Coffee!

O.K. two readers have said they doubt coffee is the villain in the case of the burlap that turned a placid hive into a very angry mass of stingers indeed – and remember, they calmed down *immediately* when I returned, same day, to my usual grain and potato sack burlap.

So, what the devil *is* it then. Burning this stuff *predictably* sets them off. I enclose a sample. Maybe this is faux-burlap and releases something weird when burned. Do you have any university-type friends? There might be some useful information here. Thanks!

Jim Lowe
Red Hook, NY

Editor's Note: *Mr. Lowe sent along a small sample that did, indeed, cause increased agitation in the two colonies I was able to apply smoke to. If you are interested in conducting a legitimate test please contact me. Preferably by email (kim@beeculture.com) and we'll see if we can organize something.*

Fondant Comments

Just a couple of comments on Charles Hunt's excellent article (November 2001).

In common with a number of commercial beekeepers in the UK, I have used bakers' fondant exclusively as a winter feed and have put a page on our association website: www.stratford-upon-avon.freeserve.co.uk/ on the subject.

There seems to be no clear definition of the terms 'candy' and 'fondant' with many beekeepers using them indiscriminately. Beekeeping literature is not particularly helpful, with TSK and MP Johansson (*Some Important Operations in Bee Management*) giving recipes for 'Soft Candy (Fondant)' and 'Hard Candy' whilst Morse and Hooper (*Encyclopedia of Beekeeping*) define candy as a 'soft, fudge-like sugar solid' A range of boiling temperatures are suggested, from 234-240°F (Johansson 'fondant'), 243°F (Wedmore quoted by Johansson), 243°F (Morse and Hooper 'candy' - did they get this from Wedmore? or Johansson?), up to 310°F (Johansson 'hard candy'). Johansson suggests adding glucose, 1 tbsp to 3 lbs sugar, in their fondant, but state that 'candy makers' use 15% glucose for "excellent" fondant.

Some sources suggest using cream of tartar in the recipe, but both of the above point out that acid-inverted sugar is toxic to bees (LE Dills, 1925) and that if inversion is desired then only enzyme-inverted sugar should be used. However, Johansson points out that 'The addition of acid arrests inversion, and accelerates crystallization, which argues against the long-established rationale for inverting sugar syrup in the first instance.

Today I telephoned my supplier of Bakers' Fondant (used by many large-scale beekeepers in the UK) to establish the technical specifications and method of production. They tell me that the fondant consists of: Sugar 74.5% +/- 0.5%, Glucose solids 14.5% +/- 0.5%, Water 11.0% +/- 0.5%. The ingredients are heated just to boiling point (approx 221°F) and are then stirred in a creamer until cool. This produces a soft, fine-grain sugar paste.

I would suggest that the term 'fondant' should be used only for this type of sugar paste, and the term 'candy' be used where the mixture is heated to a higher temperature (typically above 234°F) in order to evaporate some of the water and make a more solid product.

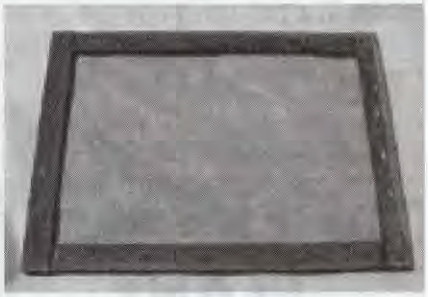
The one thing that is clear is that it would seem to be unwise to add cream of tartar!

Peter Edwards
Stratford-Upon-Avon, U.K.

TN Trap - Mine!

When I opened the Apr issue to page 30, Tennessee Trap I thought "This looks just like mine" (see picture). Then I looked at page 21, Ventilated Bottom Boards, and once again this looks like mine. Four years ago I started sampling for mites when I put in strips, my background is in industrial engineering and I have a need to know and not assume. Five years ago I lost all my bees probably because I did not treat for mites at the correct time. So I did two things, made sampling traps and joined a local beekeeping assoc. The traps have evolved to open bottom screen bottom boards which allows me to monitor mite drop through the season and I can use a form insulating board to close the bottom in the winter if temperatures get real cold.

Ken Ograin
Elmira, Oregon



Controversial Excluder

The queen excluder is probably the most controversial piece of equipment we use in keeping bees. I would like to know how other people feel about it. For years I have used a metal queen excluder. Why? Because that was the way I was taught. This reminds me of an old wives tale about cutting off the end of a ham before you cook it. This mother was asked by her daughter why she always cut off the end of the ham before she cooked it. She said that was the way her mother had taught her. When the young girl went to her

Continued on Next Page

MAILBOX

grandmother and asked the same question, she got the same answer. So the young girl queried her still-living great grandmother and discovered the answer – the end of the ham was cut off because her pan was too small to hold the whole ham. Do we operate as beekeepers in a similar fashion?

I recently decided the use of the queen excluder may not be in my best interest. I am not a pollinator; I'm more interested in producing honey. I keep bees in two standard hive bodies. My mentor taught me to use the queen excluder above the second hive body to keep the queen out of the honey supers. However, I sometimes believe I'm excluding worker bees from storing honey above the excluder; i.e., the queen excluder becomes a honey excluder. In fact, some of the more successful beekeepers in New Jersey do not use queen excluders.

There are times when a queen excluder might be useful. Use of an excluder to help locate the queen in a two-hive body colony or placing the excluder on the bottom of a stack of honey supers to keep out the mice might be two such instances. If I moved bees for pollinating services and only used one standard hive body, then I certainly understand the use of the queen excluder. But is the way I learned to use the excluder the best way? Maybe some of your readers would share their thoughts on the queen excluder.

Pat Henderson
NJ Beekeeper and chair of
MAAREC Working Group

Kudos To Dewey

I just finished reading *Africanized Honey Bees in the Americas* by Dewey Caron and I felt that I should compliment both Dewey and A.I. Root for the wonderful, if tragic tale. Certainly Africanized Bees can be called nothing less than a tragedy. But Dr. Caron has at least shed a ton of light on the situation and for me dispelled the myths. Living, as I do, in a state where we rely on a lot of migratory commercial beekeepers to pollinate at least one crop, I am sure the introduction of Africanized bees will occur at some point. Hopefully our temperate, if somewhat finicky, weather will make these bees think twice about establishing permanent residence but if they do then Dewey has shown there are ways of turning even this bad situation into something we could live with. I don't hate Texans by any stretch of the imagination but if the bees stay down there I won't be real disappointed. Thanks again for the great reading material.

Rick Cooper
Bowdoinham, Maine

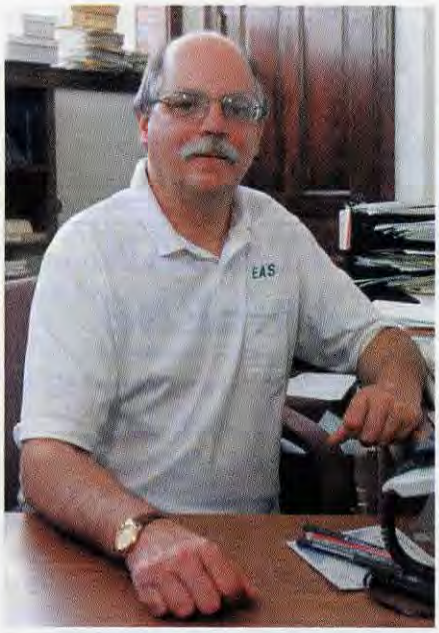
(Rick Cooper is a sideline beekeeper, and will be President of EAS in 2003)

Grafting CA Style

A month or two ago you had an article on tree grafting. Here in California we do it the easy way. First of all you have to use a double taper on the scion. This puts all the pressure where the cambion layers meet. Second – we don't put wax, gunk or anything on the graft – just 1/2 inch masking tape. Just wrap it good with three to four layers and that is all you do. No mixing, no heating, no measuring, no mess – just masking tape. It saves time. Try it, you'll like it.

Harley Crawford
Santa Rosa, CA

INNER COVER



I give a fair number of phone interviews to newspaper reporters every year. When a local situation regarding beekeeping surfaces somewhere, reporters, and their Editors, usually want something to compare – How does this situation compare to the rest of the state, the region, or even the rest of the country? They want to know if these local bee die-offs are a unique situation, or part of a similar trend in a larger picture. It makes a better story if the reader knows that everybody has the same problem, or it's only here. From a reporter's perspective, only here is better, but that's not usually the case.

Most often the questions turn to that bigger picture – how many beehives, how many beekeepers, how much honey. I keep a folder handy with a decade's worth of all of that data I've collected. It sounds good when I rattle it off, and then give the source so they can check it out. I even give the web pages, to make it easy for them. USDA data by state is pretty easy, and so is Ohio's since they both keep fairly good numbers. When it comes to the number of beekeepers, Ohio is one of the best there is in the U.S. For many of the states, though, the number is a guesstimate, based on . well, guesses, mostly.

This Spring we conducted a pretty intense survey, trying to determine how many beekeepers there are, really. We polled some bee supply companies, state inspectors, our subscription lists, state associations and some other, less accurate sources. We then take that number, look at the historical data we have, apply some common sense, a bit of magic, and, boom, we come up with a number.

The number we came up with is 90,000 hobby, sideline and commercial beekeepers in the U.S. Numbers of commercial beekeepers are easy to determine by National Honey Board contributors, and that ever-diminishing number is just under 1,000. Sideliners number about 10,000, which leaves about 80,000 hobby beekeepers within the U.S.

About 20 years ago someone guesstimated the number to be about 200,000 beekeepers, and if correct we've seen a 55% drop. Twenty years ago there were 4.2 million colonies, and there's 2.5 million now. That's a 40% drop. (If you're interested, there were 5.5 million colonies 50 years ago, but I've no idea on the number of people keeping those colonies.)

For you number people, here's some more. Twenty years ago the 'average' beekeeper had 21 colonies. Today, it's 27 colonies. Like farmers and farm size.

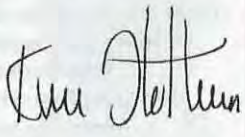
Like nuclear power plants, Winter clusters, and associations there is a critical mass – of plutonium, bees and, yes, of beekeepers, required to sustain themselves, to function, to work. I don't know what that number is for beekeepers, but we've got to be getting close. How many businesses can 90, even 100,000 beekeepers support? Even with 2.5 million colonies to care for, the bees, food, medication and all the other stuff bought each year is diminishing. But that's for another time.

But at what point do county, regional and national associations begin to feel the pinch? Even though yours may be doing fine, overall membership in county groups is way off what it was 20 years ago. My guess is there are fewer than half as many numbers now. How many times do you fight for officers before you say to heck with it? How many times do two or three people hold up the fair, or the annual display, or the picnic before they get tired? You've been there, and know it happens.

To try and save one part of this, the two national groups discussed recently the possibility of holding a single meeting – two groups, two meetings, same place, same time. It didn't work, again. Philosophical, political, financial and personal differences kept the groups as far apart as ever. Maybe further.

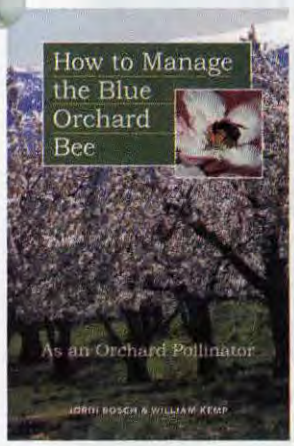
This is where the concept of critical mass gets interesting. If you bring two relatively small pieces of plutonium together to make just the right sized chunk you get lots and lots of heat and energy and light. Same with honey bees in a Winter cluster.

Not, apparently, with beekeepers.



Critical Mass

NEW . . . NEW . . . NEW



How To Manage the Blue Orchard Bee, ISBN# 1888626062, 88 pages, color and black and white photos, soft cover. $9.95 + $3.95 shipping. Sustainable Agriculture Publications, 210 Hills Building, University of VT, Burlington, BT 05405-0082.

In recent years, the blue orchard bee (BOB) has become established as an alternative orchard pollinator in North America. With a strong preference for fruit trees, BOBs are highly efficient pollinators; in fact, just 250-300 females will pollinate an entire acre of apples or almonds. BOBs forage and pollinate under cloudy skies and at lower temperatures than most other bees. They are easy to manage and rarely sting.

The blue orchard bee occurs in the east, from Nova Scotia to Georgia and west to Michigan and Texas. The western subspecies occurs from southern British Columbia to California, east to South Dakota and Texas.

Nesting starts in February in the south, to as late as June in the north. In the wild they nest in beetle burrows in dead logs. When managed thousands can be brought together for pollination early in the season.

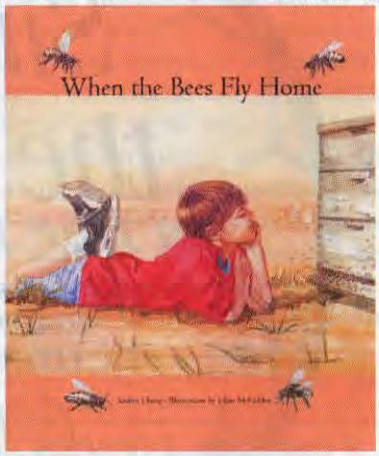
Bosch and Kemp have detailed nests, rearing, timing for emergence and especially pests, predators and pathogens. And, of course, where to get them.

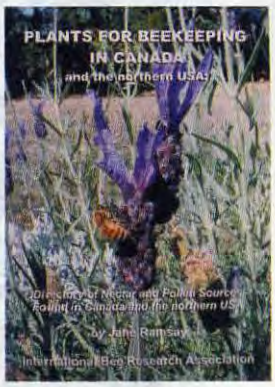
When The Bees Fly Home. Hard cover, $16.96, ISBN 0-88448-238-3, 9 x 10, 32 pages, color illustrations.

"With magical pictures and a captivating story, When The Bees Fly Home tells of a family learning to celebrate two very different sons. It's a book that will help families have lively, positive discussions about gender and differences. Alongside the story are fascinating bee facts, offering a place for the reader to alight before flying back into this poignant tale of a boy's wish for acceptance from his father." – from the publisher

This isn't a book about beekeeping, but there are lots of honey bee facts. It's about families, and kids. And how they sometimes fit, and sometimes don't. For kids six to 12. The art is incredible.

Kim Flottum





Plants For Beekeeping In Canada and the northern U.S.A., 2001, soft cover, 198 pages, $16.25 U.S. + shipping. Contact Doug McCutcheon, 2525 Phillips St., Armstrong, B.C. Canada V0E 1B1, 250.546 9870, F A X 250.546.0070.

When one begins beekeeping the interest in plants increases greatly. Which trees, shrubs and herbaceous plants produce nectar? When do they bloom, for how long and are they good nectar producers?

How do we obtain this information? Experience and "word of mouth" are the usual means. However, many beekeepers want a book that provides comprehensive and accurate information. This is it.

Information is divided into Annuals and Biennials, Perennials and Trees and Shrubs. Scientific and common names are given, blooming dates, value for honey and pollen. In addition there is considerable general information on each plant. There are no photos.

Pollen Cleaner

Frustrated with the lack of an affordable way to remove debris and dust from pollen, Lloyd Spear, producer of the Sundance Pollen Trap, has come up with a manual cleaner. Using a new furnace blower as a source of moving air, the cleaner blows dust and minor debris several feet, while the heavier pollen falls into a bag placed nearer the blower. It cleans 30 pounds in about 10 minutes. For more information call 518-370-4989. If your pollen was collected from front-mount traps or contains heavy objects such as dead bees, a final hand-cleaning may be required. Fully guaranteed with instructions. – *Lloyd Spear*

On a quick visit to the supermarket the other night, I cruised down the honey aisle and as always compared quality of appearance, prices, containers and other important items that pertains to the honey business. I noticed that regional packers seem to be getting more and more space and seem to offer a greater variety of products. Also, regional packers seem to be proud of a product produced in the United States and they show it on their label.

Most regional packers are either producer/packers or small packers that operate in a limited area. It appears their product is sold based upon its regional appeal and appearance. You get a sense that their product is produced and packed proudly by them and that pride shines through. The small packer's product shows a difference in color such as when clover honey is on the label the color reflects a white color not a ELA blend you see from national packers. Their product is not a cookie cutter blended honey, but rather it is what comes from the tank that day and is labeled that way. The products of most national packers appear the same. Why make an average product out of a superior one by blending it with an inferior one? I still don't understand that.

It would also appear that most regional packers do not pack imported honey. In most cases they support the domestic producer by using their product. They also support the domestic producer by paying for their product in a timely fashion, return barrels washed (and return your drums and not someone else's) and most times pay you to deliver your honey to them. They usually don't have questions about color or grade after delivery and usually the whole process goes smoothly. These packers compete for the same shelf space as national packers do, and they compete for bakery accounts with national packers. So why are they easier to do business with when it comes to price and color? Do they give their customer something the national packer doesn't? Are they better sales people since they always pay more for my product than the national packer? Is their service better to their customer? Do you think that price is an issue, but not the only issue, at the time of a sale?

It looks like we may be seeing more and more changes at the national level with honey packers. There will be more mergers, sales and failures. That is an opportunity for someone else. I believe that mergers offer more opportunity than failures and for some small packers the time is ripe. During a merger all fence-sitting clients have one more reason to get a new supplier of honey and that may offer the regional packer the advantage he needs.

Wise Guy

JUNE - REGIONAL HONEY PRICE REPORT

BAD YEAR IN THE SOUTH

We polled our reporters on colony conditions in late April. Overall, Winter loss averaged 18.1%, 9% were weak and 41% were strong. But the numbers revealed an interesting trend.

The drought last year in the south *may* have had a devastating influence late into the Winter. Regions 4, 6, 9, 11 and 12 all sufferered much of the season. Together, they averaged a 33% die off, an 8.9% very weak and only 30% very strong. Compare this to the rest of the regions: Died 10.2%, 8.9% very weak and 48.3% very strong. And this in April.

Three times as many colonies died in the south as the north, and a third more were very strong in the north, in April.

Region 1- Pail prices down, wholesale and retail steady, but bulk way up since last month. 15.1% loss, 6% weak and 50% very strong. Buildup average to strong so far.

Region 2 - Pail prices down, bulk way up, wholesale steady and retail up a bit since last month. 7.3% loss, 13% weak and 54.2% strong in April. Steady ad fast build up in April.

Region 3 - Bulk prices way up, all others steady since last month. 7.5% loss, 6% weak, 81.5% strong. Build up exceptional so far.

Region 4 Bulk prices way up, retail up a bit, wholesale and pails steady. 38.6% loss, 14% weak, 30.6% strong. Significant, unexplained (virus?) die-offs in early Spring. Some say much higher than 60%. Build up average.

Region 5 - Pails down, bulk way up, wholesale and retail both up some since last month. 7% dead, 13% weak and 37% very strong. Build up a bit slower than usual. Citrus crop not great.

Region 6 Bulk and retail up, wholesale and pails steady. 40.5% loss, 6.5% weak and 34% strong. Another region with high, unexplained die-offs over Winter. Build up average to slow.

Region 7 Wholesale and retail up, bulk steady, and pails down since last month. 12.9% loss. 8.1% weak and 47.7% strong in April. Build up average to mostly ahead of schedule.

Region 8 Pails down, bulk way up, wholesale and retail up some. 12.7% loss, 7% weak and 51% strong in April. Build up about average.

Region 9 Pails down, bulk way up, wholesale and retail steady since last month. 18.7% loss, 10.2% weak and only 19.5% strong.

Region 10 - Pails down, bulk way up,wholesale and retail up some. 8.8% loss, 9% weak and 17% strong. Build up slow to average in April.

Region 11 Bulk prices way up, everything else steady. 32% loss, 7.4% weak and 23.3% strong. Build up average to a bit fast.

Region 12 - Bulk and wholesale prices up, pails and retail steady. 16.1% loss, 7.4% weak and 54% strong in April. Build up average so far.

	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																
60# Light (retail)	83.50	78.60	74.00	67.33	78.00	70.00	60.83	65.00	80.00	69.00	88.00	62.00	60.83-88.00	73.02	74.30	68.73
60# Amber (retail)	68.75	70.99	68.00	66.92	75.00	76.50	66.00	61.30	70.00	62.00	80.33	60.00	60.00-80.33	68.82	73.20	67.33
55 gal. Light	0.81	1.05	0.81	0.77	0.91	0.90	0.78	0.81	0.81	0.90	0.80	0.80	0.57-1.05	0.83	0.74	0.59
55 gal. Amber	0.62	0.75	0.72	0.67	0.82	0.81	0.67	0.72	0.70	0.72	0.71	0.79	0.60-0.82	0.72	0.69	0.58
Wholesale - Case Lots																
1/2# 24's	32.47	28.64	44.34	31.36	44.34	27.43	34.89	44.34	30.00	44.34	33.00	35.00	27.43-44.34	35.85	28.74	28.86
1# 24's	46.57	42.08	48.00	44.74	45.10	53.00	50.58	43.92	45.00	43.20	49.50	49.20	42.08-53.00	46.74	45.66	42.94
2# 12's	38.98	38.06	46.80	42.10	46.00	40.00	36.28	41.00	43.50	41.80	45.00	44.13	36.28-46.80	41.97	40.64	38.69
12 oz. Plas. 24's	41.41	36.10	45.60	35.82	36.00	42.00	32.75	36.93	40.00	38.00	37.50	39.87	32.75-45.60	38.50	38.96	36.39
5# 6's	43.92	43.94	57.00	44.63	46.51	45.00	55.46	39.00	63.00	47.50	50.00	36.00	36.00-66.51	47.66	45.04	42.03
Retail Honey Prices																
1/2#	1.99	1.71	3.72	2.15	1.49	1.96	1.70	1.69	2.00	2.70	3.75	1.79	1.49-3.75	2.22	1.95	1.77
12 oz. Plastic	2.58	2.31	2.95	2.55	2.50	2.64	2.03	2.33	2.50	2.78	2.59	2.16	2.03-2.95	2.49	2.38	2.32
1 lb. Glass	3.19	2.40	3.00	3.39	2.84	3.08	2.55	2.87	3.33	3.34	3.41	2.72	2.40-3.41	3.01	2.87	2.82
2 lb. Glass	5.12	4.15	4.80	5.50	5.15	4.50	3.98	4.99	5.34	6.95	4.73	4.84	3.98-6.95	5.00	4.73	4.61
3 lb. Glass	5.33	6.98	7.80	7.25	7.00	6.50	5.38	6.96	6.67	8.16	6.61	5.51	5.33-8.16	6.68	6.41	6.23
4 lb. Glass	10.00	6.60	9.48	8.83	9.48	7.03	7.45	8.49	10.17	9.48	19.00	4.99	4.99-19.00	9.25	8.92	7.24
5 lb. Glass	11.30	9.71	11.00	9.33	10.00	10.00	11.21	9.99	9.00	7.01	9.85	8.00	7.01-11.30	9.70	9.69	9.50
1# Cream	5.83	4.20	6.24	3.85	5.50	4.93	3.19	4.71	7.24	4.06	4.46	4.07	3.19-7.24	4.86	3.58	3.36
1# Comb	4.33	3.80	3.60	4.75	4.98	4.33	4.45	4.28	5.00	4.98	6.50	4.50	3.60-6.50	4.62	4.65	4.46
Round Plastic	4.58	3.18	3.60	3.61	4.07	3.75	5.32	3.74	5.00	4.07	4.67	3.85	3.18-5.32	4.12	4.10	3.78
Wax (Light)	2.40	2.26	2.00	1.70	2.41	2.50	1.83	2.15	2.50	2.50	1.63	1.50	1.50-2.50	2.87	2.94	2.58
Wax (Dark)	1.75	1.48	1.75	1.38	1.79	1.08	1.25	1.25	1.10	1.79	1.50	1.11	1.08-1.79	1.44	2.82	2.15
Poll. Fee/Col.	41.17	39.83	34.00	35.25	30.00	40.00	41.36	40.00	22.50	35.83	30.00	39.33	22.50-41.36	35.77	37.40	38.33

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"Little is known about the development of the overwintering population of honey bee colonies in a temperate climate."

When it comes to longevity, not all worker honey bees are created equal. One of the fascinating adaptations of the perennial honey bee colony is the production of different types of workers, known generally as "Summer" and "Winter" bees. Summer bees are workers produced from late Winter (or soon thereafter) until late Summer and typically have only a short lifespan (ranging from 25-40 days). These bees form the bulk of the industrious forager force during most "honeyflows" and, thus, are much beloved by beekeepers interested in extracting surplus honey. Winter bees are those reared by a colony in the Fall that exhibit a comparatively extended lifespan. The lifespan of winter bees has been reported by various researchers to average from over 100 days up to 300 days! Winter bees usually delay foraging activity until the following Spring and are, instead, primarily responsible for the overwintering success of a colony. As such, they are as equally beloved as Summer bees by beekeepers interested in coming through the Winter with an apiary of live honey bee colonies.

A number of researchers have studied the individual physiology of Summer and Winter bees and have reported hormonal differences and differences in fat body reserves (see below*). However, the factors that might be responsible for the transition from the Summer bee to Winter bee population within honey bee colonies are not well known. The authors of a recent research paper (Mattila et al, 2001) reported that evidence regarding the role of external signals (such as temperature and photoperiod) in inducing the appearance of Winter bees was inconclusive. However, they found that internal changes in the colony (such as those associated with requeening) could affect the timing of production of the winter bee population.

In experiments conducted in Manitoba, the researchers set up four experimental groups in late July from an original population of hives that had been started in April with package bees and mated queens. The four colonies of group A (the control) were allowed to keep their original queens. The six colonies of group B were requeened with new mated queens. The six colonies of group C were requeened with virgin queens. The six colonies of group D were made queenless and allowed to rear new queens. From each colony, the researchers marked 100 newly emerged workers (an "age cohort") every 12 days, starting on July 14 and continuing until the end of Fall brood rearing. Each time a new batch of workers was marked and reintroduced to their original colony, the colonies were inspected for the number of marked bees remaining from each of the previous cohorts and measurements of brood area were taken. The marked bee counts were stopped on October 30 due to winter clustering and brood area measurements stopped near the end of November. On March 11 the next year counts of brood area and bee survival resumed and continued until 27 June when no more marked bees could be found.

The researchers found that the first four or five cohorts of bees that were marked and reintroduced were all Summer bees (they were short –lived). Winter bees were first detected in the cohorts introduced on August 31 to the control colonies. Approximately 40% of the bees in that cohort were Winter bees, based on their subsequent reduced mortality. For example, while none of the age cohort introduced on August 19 lived beyond the end of October, some of the bees from the August 31 cohort survived until the following May! This pattern of replacement of Summer bees with Winter bees also occurred in the requeened colonies (groups b, c, d) but was delayed. Thus, in requeened colonies, Winter bees were first detected in the cohorts introduced on September 12, 12 days later than the controls. Overall, group A produced over 50% of their Winter bees in the first two 2 cohorts following the start of Winter bee production. In the requeened colonies, Winter bee production was delayed such that these colonies did not reach the over 50% mark (of Winter bee production) until the third and fourth cohort following the start of Winter bee production (some 36 days later). These differences in distribution were found to be statistically significant.

In their discussion, Mattila et al point out that the "development of a Winter bee population is not stimulated solely by environmental cues associated with Winter in a temperate climate, but is also influenced by factors within a colony" They go on to suggest that length of life may be influenced by brood rearing activity and that the shift to Winter bees happens sooner in colonies that cease brood rearing earlier (such as those that are not requeened in the fall). The authors conclude that additional experiments that include measurement of physiological and behavioral changes in the bees will be necessary to determine whether larval or adult events lead to Winter bee status.

As scientific investigations yield information to help unravel the mysteries of honey bee biology, they also point out new areas where additional knowledge needs to be acquired. For the beekeeper, this interesting research report also raises beekeeping management questions that remain to be answered. For example, is there a benefit, or a cost to the colony associated with delayed Winter bee production? Would an early or particularly harsh Winter put colonies with delayed Winter bee production (such as those requeened in the fall) at risk? Finally, as with the timing of a number of beekeeping practices, would this risk vary according to climatic region? BC

Reference:

Mattila, H.R, J. L. Harris and G. W. Otis. 2001. *Timing of production of winter bees in honey bee* (Apis mellifera) *colonies. Insectes Sociaux 48:88-93.*

**For discussion of hormonal and other physiological changes in winter and summer bees, see various references cited in the above scientific paper.*

Mark Winston

Chloramphenicol

"Chloramphenicol is only used in human medicine for serious and unusually resistant infections, and only as a last resort when other drugs have failed."

It seems like a pretty useful medicine, chloramphenicol. It's an antibiotic that wipes out bacteria by preventing them from producing proteins, but has no effect on human protein synthesis. Chloramphenicol can be taken orally, is metabolized in our livers and harmlessly excreted, and rarely causes allergic reactions. The Merck Manual, which is the doctors' guide to all things chemical, compliments chloramphenicol's wide spectrum of activity against diverse microbes, and considers it an important treatment for typhoid fever, meningitis, Rocky Mountain spotted fever, and some rickettsial infections.

Just one little problem it can cause an irreversible, idiosyncratic, and fatal blood disease called aplastic anemia. The incidence of aplastic anemia following chloramphenicol use is somewhere between 1 in 25,000 and 1 in 75,000, but that one unfortunate individual has their blood platelets and white blood cells damaged, bleeds from the nose and mouth, bruises all over their skin, and frequently dies.

For that reason chloramphenicol is only used in human medicine for serious and unusually resistant infections, and only as a last resort when other drugs have failed. Regulatory authorities in most of the developed world also have banned chloramphenicol from use in animals reared for food production, recognizing the potential impact on human health if people are exposed to its residues in food products. Chloramphenicol is still used to treat infections in pets, but not externally because of concerns that owners could be exposed when applying it to animals by absorbing it across their skin.

Thus, it was with some alarm that British, and then Canadian, regulators discovered in February (Britain) and April (Canada) that not only had Chinese honey tested positive for chloramphenicol residues, but a diverse array of muffins, bagels, and cookies had been baked using the tainted honey and sent to market. Health hazard alerts were issued quickly, and products recalled, but beneath these regulatory actions lies a cautionary tale about the randomness of regulatory practices and the economic pressures on beekeepers to produce cheap honey, a tale that reveals the seamy underbelly of international honey markets.

Chloramphenicol might never have been discovered at all in Chinese honey, because it is usually not included in the standard battery of tests randomly conducted by regulators. It actually wasn't chloramphenicol that was first discovered in the honey from China, but another antibiotic, streptomycin, that also has no business being in honey. The British announced the detection of streptomycin residues on 7 February, and were inspired by this discovery to test for other illegal substances. On 19 February they proudly announced another startling regulatory discovery, their finding of chloramphenicol residues.

This was considered a bit of a coup for the British Food Standards Agency, because the residues were low and the analysis for chloramphenicol requires a particularly sensitive testing protocol. Most countries, including Britain, don't usually screen honey for chloramphenicol, because the analysis is somewhat difficult and there is no reason to suspect that beekeepers are using it.

The Canadian Food Inspection Agency (CFIA) was caught off-guard by the British announcement, and quickly realized there was no immediate capacity in Canada to conduct the necessary tests. It took almost two months to develop CFIA's analytical capability to test honey for chloramphenicol, but by 18 April Canada also released a public warning and recalled 63 products in eastern Canada baked from honey potentially tainted with residues of this nasty antibiotic.

The impact in Canada was huge, creating considerable public angst about honey in general, partly because of the chloramphenicol residues themselves but also because of two unrelated Canadian obsessions, hockey and donuts.

There is no single phenomenon in the United States that unites Americans the way our pervasive hockey culture unites Canadians. Unfortunately for our Canadian beekeepers, some of the products baked with the tainted honey were produced by Tim Hortons, a national donut chain founded by the late Tim

Continued on Next Page

"Perhaps we should pay more attention to the purity of honey rather than to its price."

Horton, a great Canadian hockey star of yester-year.

Canadians also have a national affinity for donuts, especially in eastern Canada, where there are more Tim Hortons donut shops per capita than there are doctors to treat the epidemic of obesity caused by overeating Tim's donuts by Canadian aficionados. While it was a "healthier" Tim Hortons' product, bagels, that was affected, the subliminal connections between honey, donuts, and hockey amplified the scandal to a major story in the Canadian national news.

Product recalls and hazard warnings with the word "honey" in them can't be good for beekeeping, but also beg the question of why so much tainted honey was moving through world markets in the first place. One answer, of course, is economics. Even after shipping, bakery-grade Chinese honey is cheaper than the equivalent U.S. or Canadian honey.

For honey importers and packers, there is considerable social pressure not to pack foreign honey for sale on grocery shelves, and labeling requirements to identify country of origin provide a negative marketing image for those tempted to sell Chinese honey directly to consumers. However, honey used in baking requires no public identification or even admission of its origin, with an anonymity that encourages importers to seek the cheapest source without fear of social or economic reprisals from the beekeeping community or the public.

Another question seeking its answer is why were streptomycin and chloramphenicol in Chinese honey in the first place? The answer, of course, is rooted again in economics, with a twist of pest management thrown in. Antibiotics used for animal husbandry are cheap, and easily obtained internationally for use in non-approved areas such as beekeeping. Add the twist of antibiotic resistance that has developed for approved substances such as terramycin, and it's not surprising that the Chinese crossed the legal line into banned substances.

Lest we get too self-righteous, there are American and Canadian beekeepers doing the same thing, and privately bragging about it to boot. National standards in both our countries are strict but testing is lax, and analyses of honey produced and sold within Canada and the United States is less intense than for imported honey.

We also could ask why the Chinese felt compelled to use streptomycin and chloramphenicol in the first place, but I think we know the answer to that question. It's the same reason that beekeepers in Canada and the United States use unapproved antibiotics against American Foul Brood, and illegal miticides to control *Varroa* mites.

Bee diseases and parasites world-wide have become resistant to the soup of chemicals that some beekeepers indiscriminately dump into their hives, and the Chinese are no more or less guilty of overusing chemicals than we are. They are, however, more unfortunate in having access to a wider array of banned substances, as well as having the attention of our regulatory agencies as a result of trade wars that have erected tariff barriers against the importation of cheap Chinese honey.

Chinese honey should be banned because of illegal residues, but perhaps the use of cheap, unlicensed chemicals is driven in part by economic pressure to reduce honey prices even further to combat the heavy tariffs imposed on Chinese honey by American trade rules.

We should increase testing for all potentially contaminated honeys, especially from regions in the United States, Canada, and overseas where resistance by AFB and *Varroa* to antibiotics and miticides is epidemic. A clean bill of health for honey is vital to our industry's well-being, whatever the honey's geographic origin.

We also might want to consider carefully whether tariffs and trade barriers are in the long-term best interests of national and global beekeeping. We all suffer from consumer uncertainty about honey purity, and stories about contaminated honey in our national media are harmful for all beekeepers, no matter where the honey may have originated.

Perhaps we should pay more attention to the purity of honey rather than to its price. Suppose all of the funding that has gone into lobbying for international trade barriers had been diverted to increased testing of honey of both national and international origins. Imagine that the salaries of government trade officers and lawyers were diverted towards purchasing more laboratory equipment and hiring more technicians to properly test honey for contaminants.

Perhaps we've chosen the wrong area to lobby governments to intervene on our behalf. A stronger regulatory presence on health issues such as honey testing might better serve our industry than the current focus on protectionist tariff intervention.

It's basic business strategy. Our focus should be on producing clean honey at a premium price. Trade barriers based on purity are more justifiable than those based on economics, and beekeepers would be wise to eliminate all contaminated honeys from our markets, whatever their origins. BC

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Apimondia In Africa

A Potpourri of Bee Biology

Malcolm T Sanford

As might be expected, the Standing Commission for Bee Biology had the majority of papers at the 2001 South African Apimondia congress in Durban. This included major sessions on both the cape bee problem and Africanized honey bees described in earlier reports. In addition, there was a wide range of presentations on other topics.

Z. Stanimirovic and colleagues presented results of a study examining the variability of hygienic behavior in two eco-geographically different populations of *Apis mellifera carnica* in Serbia, Yugoslavia. Some may remember that the first bees imported into the U.S. considered to be *Varroa*-tolerant were Carniolans from Yugoslavia, now known as Serbia, and called by many "Yugo" bees. They did not do well according to most reports, and efforts were soon diverted to "Russian" bees, which are now being studied extensively. The Serbian investigators observed great variability in populations of both yellow bees from Machva and grey bees from Rudnikand, some being considered "superhygienic," when looking at uncapping and removal of diseased larvae. Thus, they concluded, "The superhygienic-potent honey bee colonies (regardless of queen age) at nine-investigated localities in Machva region and at ten-investigated localities in Rudnik region could be used as breeding colonies for rearing of quality queens." If such variability is found in traditional hygienic behavior, perhaps a similar amount is found *Varroa* tolerance as well.

K. Gramacho and L. Gonçalves from the University of São Paulo, Brazil presented information suggesting a new hypothesis for the origin of hygienic behavior based on sequences they observed in observation hives, including puncturing the capping, removing the capping, and removing the cell contents. Therefore, instead of two recessive genes (u=uncapping and r=removing) as proposed by Dr. Walter Rothenbuhler in his landmark studies on this behavior, the authors believe there are three (u1, u2 and r). Thus, they conclude, "In order to uncap the cell, the bee should have both u1 and u2 genes as homozygous (u1/u1, u2/u2). Only one u1 or u2 gene as homozygous would determine the puncturing (u1/u1, u2/+ or u1/+,u2/u2) and the three genes as homozygous would be responsible for the uncapping and removal (u1/u1, u2/u2, r/r)." This theoretical difference might have some value to those rearing hygienic bees in the future, but the current bioassay (test) for this is strictly behavioral and, therefore, by default includes all possibilities presented in this study, as well as deduced by Dr. Rothenbuhler.

A. Langowska and associates of the Agricultural University of Poznañ in Poland investigated the effect of drone presence on colony nutrition. They carried out experiments to find out whether the presence of drones influences the quality of worker bees, measured by survival ability, size of pharyngeal glands and fat body, and the content of total protein and crude fat in their bodies. They conclude: "The comparatively small consumption of food by worker bees kept with drones indicates that in the presence of male bees, the organism of workers works more effectively, i.e. it utilizes in a better way the components contained in food. It must be stressed that next to the high survival rate in the worker bees consuming carbohydrate food, there occurred also a better development of the pharyngeal glands where protein is particularly necessary. The presence of drones had also a positive effect on the content of total protein and crude fat in the bodies of worker bees consuming sugar candy." This study may change the minds of some beekeepers concerning the value of drones in a colony; their purposeful removal may not be as benign as once thought.

M. Lodesani and colleagues at the Istituto Nazionale di Apicoltura, Bologna, Italy compared naturally mated (NM) and instrumentally inseminated (IIS) two-year-old queens. The relationship between queen weight and ovariole number and between residual sperm and ovariole number was found to be significant only in IIS queens. The authors conclude, "The latter correlation could be due to greater uniformity of IIS queens ovaries and to a probable relationship between spermatheca dimension and ovary development, because in IIS queens the quantity of sperm contained in the spermatheca depends on its dimensions considering that the injected amount was constant (8 ml)." The ovarioles were counted in both groups and though there was no difference in their number, they appeared more uniform in size and in reproductive activity in IIS queens. "This 'mature' stabilisation of the ovary is associated with an increase in the ratio between ovary weight and total queen weight is reached earlier in IIS than in NM queens, showing that IIS queens are subject to premature ageing."

The results, according to the authors, show an absence of influence of instrumental insemination and/or anesthesia on weight increase. There also appears

to be few differences in the other categories studied, suggesting no inherent liability found in instrumentally inseminated queens. The authors believe these studies will lead in the future to an in vivo (while still alive) assessment of queen bees. Thus, no longer will they have to be sacrificed to determine their reproductive potential.

Other studies included in the bee biology commission are those reported by G. Sabatini and M. Lodesani of the National Apicultural Institute in Bologna, Italy on continued use of honey bees as environmental monitors in <http://www.lacarlina.com/locandina/locandina.htm>. This three-year research project, which also includes other areas of apiculture (honey and honey bee conservation biology), is a first for Italy, although the country has been a leader in this kind of monitoring for many years.

A study by V. Garnery of Suez Canal University, Ismailia, Egypt and associates has to do with molecularly characterizing a rather large population of the Egyptian honey bee (*Apis mellifera lamarckii*). It evaluated microsatellite and mitochondrial DNA variability in a population of *A. m. lamarckii* from Assiut governorate. This research derives from a larger project to select and breed native honey bees suitable for commercial beekeeping in Egypt. There is some evidence that the original honey bees of Egypt might be more tolerant of a wider range of diseases and pests than the *A. m. carnica* in general use by Egyptian beekeepers. For a extended analysis of beekeeping in that country, see the author's report on consulting efforts in that country in 1992 <http://apis.ifas.ufl.edu/apis92/apmar92.htm#1>.

Views of Honey Bee Biology

Apimondia has always been somewhat of a conundrum not only for scientists, but also for beekeepers that attend. This is due to the juxtaposition of both the practical and theoretical, which sometimes seem intermixed in a bewildering way. This also tends to bring out what some might call "fringe elements." I recall one presentation by a participant in Hungary (1983 Apimondia in Budapest) whose "scientific hypothesis" was that wearing bee beards was something that every beekeeper should do to promote the craft. It was punctuated with many slides showing the act of putting on the bees and taking them off. At that time I wondered why the organizers put this fellow on the stage and how they determined this topic was something of importance to world beekeeping. I have subsequently understood that one of the charms of these congresses is that they do bring out a great diversity of opinion, although on occasion it can get out of hand.

At the South African congress, for example, two papers by S. De León of Uruguay were presented on how biologists should revamp their study of genetics, calling it instead something derived from the Greek language, "arjetics." He concludes, "...on the investigation made by differents (sic) scientists the author draws biological conclusions that lead to think that bees are sexless and each one has an (sic) own and distinguishable origin. Then he makes a distinction between fertility and fecundity which clarifies the application of the terminology,"

In a companion paper, Mr. De León discusses drones, concluding that "the author presents a different vision to the classical appreciation which defined the drones. While literature maintained that bees belong to a genetical species, they said that the drones (sic) is a haploid bee. After several consideration the drone is defined as a disjunction of the diploid organism. And therefore is not the son of his mother as used to be said, but a derivative and for this reasons is not generated, which is not comparable to a genetical queen impeded to produce organisms whit (sic) one half of the mother's cells."

More understandable and coherent was the presentation by Dr. Zbigniew Lipiński of Poland. In his paper, "Adaptation and Stress – Main Cause of Nest Abandonment by Honeybee Swarms," he says in part, "According to Aristotle (384-322 B.C.), the leading naturalist of ancient times, the reason for swarming was an excess of queens in a honey bee colony 'a plurality of chiefs brings a fission of a swarm into two parts'. This concept probably originated from observations that the natural swarming of bees is always preceded by the rearing of new queens. In spite of the fact that this first hypothesis of natural swarming has never been fully scientifically proven, it still remains a basic theoretical foundation in discussions of the nature of swarming in honey bees. A literal interpretation of this hypothesis (in spite of its correctness to some degree) seems to be one of the major reasons for the lack of clear progress in understanding of, not only the nature (essence and mechanism) of swarming, but also all other forms of nest abandonment by honeybees. The current situation is such, that no single theory adequately explains all aspects of this subject."

Thus, Dr. Lipiński concludes that swarming is not necessarily reproductive, but often more related to stress imposed on colonies, and, therefore, swarming and what is generally called "absconding" are much more related to each other than previously thought. However, because the traditional reason for swarming (reproduction) has been taken as a given, it has blinded many who might otherwise include the other possibility in their studies.

Dr. Lipiński has written a book on this subject entitled: *The Essence and Mechanism of Nest Abandonment by Honeybee Swarms*. It was entered in the competition of academic beekeeping resources (books) in Apimondia and won the gold medal <http://www.beekeeping.com/apimondia/medals_durban.htm>. The book's three main conclusions are:

1. We should protect bees from the action of stress stimuli.
2. We should keep young honey bee queens in hives for their potent tranquilizing effect on bees.
3. We should at all costs try to keep reserves of aboriginal bees as a precious source of genes.

There is a great difference between the two approaches described above. Dr. Lipińskis' presentation and book are richly referenced and represent a good review of published

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literature. Indeed, the book contains 62 pages of references, almost a quarter of the publication. The paper by Mr. León, in contrast, contains no references. Indeed, the author claims to have come up with the term arjetics himself and first published about it in the Argentine beekeeping journal, *Espacio Apícola* <http://www.apicultura.com.ar/apis_40.htm#arjetica>. That article, in fact, is the only reference to this term I could find on the World Wide Web or in the University library. The organizers, nevertheless, accepted both for presentation at the Durban congress.

Bee Pathology

The Standing Commission on Bee Pathology at Apimondia was almost overwhelmingly concerned with *Varroa* mites as described elsewhere in this report. But it also convened sessions on the effects of other organisms on honey bee colonies, and a symposium on the world's most significant bee disease, American foulbrood.

There was only one paper on tracheal mites presented at the meeting. The lack of emphasis on this exotic organism suggests that its importance as a bee pest has either declined and/or been preempted by others. Drs. S . Sumner and W. Mangum of Mary Washington College, USA described a mathematical model they have developed based on worker honey bee autogrooming behavior, pioneered at the Baton Rouge, Louisiana Bee Laboratory by Drs. R. Danka and J. Villa <http://www.nal.usda.gov/ttic/tektran/data/000008/37/0000083719.html>. The model is age-structured, and concentrates on bees less than one-week-old that are most attractive to phoretic (questing or searching) mites transferring from older bees, and, therefore, form the most susceptible group for re-infestation. The authors state that without autogrooming bees, the model predicts the number of infected bees will rise. However, with autogrooming bees, while all other parameters remain the same, the number of infected bees will approach zero over time. Using this kind of model, they conclude, the number of autogrooming individuals can be varied to show how many might be necessary to protect the colony from an increase in the number of infected bees.

In the area of fungal diseases, a Russian study by M. Moukminov and colleagues reported a treatment for *Aspergillis niger*, which is responsible for causing stonebrood that is epidemic in that country. They described a preventative and disinfectant treatment based on a preparation from electro-activated water-salt solutions containing active chlorine and iodine ions (iodochlorine). A Chinese study (J. Wang and associates) showed that carniolan bees (*Apis mellifera carnica*) were much more tolerant to chalkbrood (*Ascosphaera apis)* than Italians (*Apis mellifera ligustica*). Again it is believed their hygienic behavior is superior, but another conclusion the authors suggest is that the royal jelly of carniolan bees has greater "bacteriostasis" (inhibition of bacterial growth) than that of Italian bees.

Reminiscent of the bear-beekeeper confrontation found in the Americas and Europe <http://apis.ifas.ufl.edu/apis99/apdec99.htm#4>, South African beekeeping has its own with ratels or honey badgers <http://www.awf.org/wildlives/183>. A report entitled: "The Conflict Between Beekeepers and Honey Badgers in South Africa: A Western Cape Case Study" describes honey badgers (*Mellivora capensis*) as "vulnerable" in the South African Red data book <http://www.uct.ac.za/depts/stats/adu/p_rdb.htm>. Thus, they are protected in the Western Cape province, being considered uncommon throughout their range.

Fifty beekeepers maintaining more than 24,000 beehives in the Western Cape were interviewed by the authors in areas where badgers were reportedly causing damage, estimated to be US $65,000 yearly. Eighty-two percent confirmed that badgers were a significant problem and 50 percent admitted killing them. During the year-long study, 13 badgers were killed in the 234 square kilometer study site. While seventy-eight percent of beekeepers had attempted some form of hive protection, twenty-two percent continued to kill badgers and non-target species, despite the high annual costs involved and the availability of cost-effective, long-term solutions. Continued, illegal persecution of honey badgers by beekeepers, the authors conclude, appears to be driven not by a lack of viable solutions, but rather by negative perceptions of these protected mammals.

American foulbrood continues to be one of the world's most feared honey bee diseases. It is found everywhere, except sub-Saharan Africa. H. Hansen and C. J. Brødsgaard of the Research Group Entomology, Danish Institute of Agricultural Sciences provided a lengthy description of the historical aspects of the disease, along with current developments in its control and detection.

The authors say that in 1769, Schirach named a diseased condition in honey bee (*Apis mellifera*, L.) brood called 'foulbrood' In 1906, White named the bacterium associated with the disease as *Bacillus larvae*. The disease was called 'American foulbrood' (AFB) because the investigations were carried out in New York State. Most recently, *B. larvae* was reclassified as *Paenibacillus larvae* subspecies *larvae*. Spores of *P. l. larvae* can survive in larval food, soil and scales (the dried remains of dead larvae) for many years, and they are very resistant to heat. It is possible that different strains of the bacterium have distinct resistance to heat treatment. The authors describe a study, where wax from bee colonies with clinical symptoms of AFB was melted with steam in a wax processing plant, yet continued to show a light contamination. They also say that treatment of *P. l. larvae*-contaminated wooden hives by scorching with a blowtorch will not destroy all spores.

P. l. larvae spores can infect the larvae of workers, according to the authors, as well as queens and drones. Larvae younger than 24 hours are the most susceptible and older larvae are increasingly resistant. Several studies report that colonies without clinical symptoms of AFB may contain honey contaminated with large numbers of spores.

Field experiments with induced infection by *P. l. larvae* have shown that infected colonies may eliminate these infections and that no simple correlation exists between the number of spores in the honey and the first visible signs of AFB in capped

brood cells.

Fortunately, the authors say, the natural spread of *P. l. larvae* is low, mainly because most spores are removed from circulation by the hygienic behavior of the adult bees and because only the youngest larvae are susceptible. Drifting bees and/or queens, even though possibly contaminated, are not major factors in its spread. The major way the disease is propagated is by feeding colonies with honey contaminated with *P. l. larvae* spores, by bees robbing honey from infected colonies, or by feeding colonies contaminated pollen. Infection is also assisted by beekeepers manipulating contaminated brood combs and/or equipment.

Pollen contains microorganisms which act as antagonists against *P. l. larvae*, the authors state. Thus, queen larvae, which are fed the least amount of pollen, are most susceptible; worker larvae fed moderate amounts of pollen are intermediate, and drone larvae fed mostly pollen are least susceptible.


Honey Badger

Tolerance or resistance to American foulbrood is also conferred by:

1. Larval food, which inhibits germination of the spores (note the Chinese study reported elsewhere on chalkbrood resistance in carniolan honey bees).
2. Spores being removed by the honey stomach's "honey stopper." (proventricular valve)
3. Hygienic behavior of adult honey bees in uncapping and removing diseased larvae and/or pupae.

Prevention and control of American foulbrood is different in many parts of Europe than the U.S. according to the authors. Both schools recommend not feeding pollen or honey from affected colonies. In Denmark, it is recommended not to use drawn comb more than three years and some beekeepers renovate their combs each year. Since there is no antibiotic use in Denmark, beekeepers have to be much more careful in this regard. Additionally, the authors say that burning colonies is not recommended as it tends to select only stronger colonies, which usually get the disease first by robbing out weaker, more affected hives. Instead, they recommend the "shaking" method be employed, where adults are transferred onto new foundation in renovated colonies. The affected combs are then melted down and reworked into foundation. Wax foundation may still contain spores, but not enough to seriously affect colonies.

Other Danish recommendations, according to the authors, include scorching affected equipment with blowtorches. The use of ethylene oxide is not recommended and there has been little work except in Australia using irradiation (cobalt 60). The principal idea behind the Danish and European philosophy is to reduce the number of spores to a manageable level. This level, the authors conclude can be as low as eighty percent reduction in the number of spores and still be an effective control.

The use of antibiotics for prevention and fire for colonies with active symptoms of American foulbrood in the U.S. is much more forgiving and less labor intensive than the European system according to the authors. They warn, however, that antibiotics do not kill spores, and so such treatment is not necessarily superior. Antibiotic use carries great risks as well, including those of contamination of hive products and the development of resistant bacteria. The latter, the authors conclude, has already been detected in the U.S. and elsewhere (Argentina). Their recommendations for the future: "Beekeepers should be encouraged to use AFB-resistant bee strains, to look for disease symptoms in general, and to use prevention and control methods without veterinary drugs."

Dr. I. Fries of the Swedish University of Agricultural Sciences, Uppsala, and colleagues studied the sub-Sahara African situation. They analyzed honey samples from individual beekeepers (15 samples) as well as packed honey from the market (24 samples) from 5 different sub-Saharan African countries. No spores were detected. At the same time, spores of the pathogen were common in samples (14 samples) of honey imported from other continents and retailed in Africa, as well as in African honey from countries north of the Sahara. The authors suggest various reasons for this, including absconding (leaving the nest), rustic beekeeping (exchanging equipment is minimal) and superior hygienic behavior of extant bee races or ecotypes. They conclude provocatively that imported honey contaminated with AFB spores may not substantially increase the risk of establishing the disease, given that large spore doses, often in the billions, are required to produce symptoms when honey is fed to disease free colonies

Dr. Fries and S. Nordström reported on a study comparing examination of adult bees versus looking at honey for early detection of AFB (spores). They conclude it is more reliable to look at brood and/or adult bees than honey. A. Gregorc and I.D. Bowen of the University of Slovena at Ljubljana reported that using information on cell death could be important in monitoring both infective and chemical environmental stressors on honey bees. They compared the effects of inoculations of AFB and the antibiotic, oxytetracycline, concluding, "Immunohistochemical assays have been developed in honeybee biology and pathology to demonstrate and also quantify programmed and necrotic cell death caused by antibiotic and bacteria. The research methods used in our experiments could detect the cellular responses of larval tissue suffering from environmental stressors and could potentially be used for diagnosis in a range of biological models." BC

Dr. Sanford is former Extension Specialist is Apiculture, University of Florida. He published the APIS Newsletter: http://apis.ifas.ufl.edu

James E Tew

Bee Culture's Beeyard

2002 – The Year that Spring Roared in the beeyard

Why should you care?

I have never had this happen so completely – not in many years – if ever. As I was finishing writing this piece, I knocked off for lunch. Upon my return, my computer had been busy doing things on its own while I was away. Apparently, it became confused and crashed – taking my newly finished article with it. Normally, I can always get such lost documents back – someway – but not this time. My problem. Not yours. I will see if I can get it right this time. Now, as I was saying before lunch.....

Some observations on observation hives

The Nashville Zoo Observation hive

I visited my brother in Tennessee last week (April). Naturally, some beekeeping chores were on the list. One of the tasks was to work the Nashville Zoo Observation hive. It was chocked full of bees with a bee beard on the outside of the building. They were garnering too much attention and the call for help was sent out.

It would be easy to be a bit apprehensive about working this hive. People are everywhere and the hive is perfectly located to be viewed, but not perfectly located to be worked. It sits next to a glass wall and being made of glass itself, it is remarkably difficult to photograph, so no photos of it are presented here. However, as shown in Figure 1, the "3-frame core" of the unit can be removed from the display, taken to a safe place and re-worked there.

Simple observation hive design

The core of the Nashville Zoo Observation hive is from the same design that I described in the December, 2000 *Bee Culture*.[1] Actually, there are two cores, one in storage awaiting stocking while the other is on display at the Zoo. Under ideal conditions, a newly stocked core is taken to the zoo and used to replace the displayed core. Again, the number of people who are always around cannot be ignored; hence the reason for trying to keep **ALL** bees contained and under complete control. All went well and Dwight saved the day.

Dwight manipulating the Nashville Zoo Observation core hive.

A truly interesting observation hive

Barry Richards, a Tennessee beekeeper, has a truly interesting observation hive – one that you can see from your computer. Barry has installed an infrared camera in a hive near a shed housing his modified computer. You can have a look at this novel observation hive at: http://www.hivetool.com

Follow the instructions by clicking on the photo of the bee, then follow the subsequent commands. The bees are close and you will not be able to see much more than a few bees moving about at about 10 second intervals, but Barry has been clever in his special observation hive. No doubt we will be doing more of this electronic beekeeping in the near future. Figure 2 shows Barry's bee house and televised beehive.

Due to the infrared camera "seeing" in the darkness of the hive, the picture's in black and white. Figure 3 gives an idea of what you will be seeing when you log on.

It will be helpful if you have cable access and some patience, but the experience should be rewarding for you and set you to thinking about what you could be doing to computerize your hive.

[1] Tew, James E. *Build this Simple Observation Hive, http://bee.airoot.com/beeculture/months/00dec/00dec2.html*

The computer bee house. The rear hive is televised on the web.

View of an electronic observation hive.

A large observation hive for the OSU Wooster Bee Laboratory

I recently purchased a large, furniture-grade observation hive from Linda and Jerry Boblentz in New Brockton, Alabama. The unit is one-of-a-kind, custom-built and is six single frames high. The is electrically driven to slowly rotate. The entrance is at the bottom and the unit can be picked up off its base if necessary. The hive has double glass – one of window glass and a second layer of Plexiglas for protection against eager kids.

Each year, we get substantial numbers of tour groups who come by the bee lab to see the bees make honey. An observation hive is critical for us to show off bees in an educational light. I look forward to using this unit for years to come.

Spring roared

I mentioned that "spring roared in" this year. We had some of the warmest weather in the past 100 years. Apple blossoms went from tight pink to fully open nearly overnight. The bees, caught up with the spring fever, began frantic swarming.

On the day that I was installing the observation hive and hosting a grade school group, I realized that I had three swarms in the air – at once. What a mess. As the bus unloaded, I had thousands of bees flying all about and a worried teacher. Of the three swarms that day (of which I am aware), I managed to keep only one – one that went back to the parent colony.

Though I have ready access to bee books, fact sheets, web pages and personal experience, I seem to always be surprised at the arrival of spring. Yep, we had some swarm boxes ready, but should not be needing them for a few more weeks, so they were in the barn, a short drive away – while I had bees swarming right now, a tour group and an observation hive open.

The swarm that returned home

A five to six pound swarm issued, flew all about, made a scene and then returned the parent hive. What to do? I had managed to get some empty deeps and I made half splits. Essentially, I just halved the colony giving each half an empty deep. Also, I moved three frames of brood into the top deep and placed three empty frames in the bottom deep. I made no effort to find the queen, but rather only made certain that each half had queen cells. Will this desperate process be successful. I don't know. I suppose I will give myself about a 50/50 chance of the swarm deciding to stay home. There is a very real possibility that each half will now swarm. But at least for the day, I caused enough confusion that the swarms should reconsider its future. To those swarms that left, good luck. You're on your own.

What did I do wrong? I'm not sure it's totally my fault. I should have kept young queens in the hives, but this *was* a young queen – less than one year old. I could have provided more brood nest space, but they weren't completely crowded out. I think these bees wintered well during the mild Winter and that the abnormally warm Spring days threw them into a swarming frenzy. They certainly had me in a frenzy. The beekeeping fact is that swarms frequently get away. Don't blame me.

Comments on the use of the Screened Bottom Board

In past articles, I asked for some of your experiences on the use of screened bottom boards. I've had quite a number of responses.

A commercial beekeeper told me that he could not use screened bottom boards in his operation because roaming swarms were attracted to the bottoms of his hives. Once clustered there, they would negatively affect the queen within the screened colony. This was particularly bad on mating nucs. I suppose the advice is that if you are producing queens, be cautious when using these open bottom boards.

A note of caution came to me from a Canadian scientist who is still conducting research and will be publishing results obtained from recent research. He has observed an ***increase*** in *Varroa* populations when using an open screened bottom board in his cool climate. He suggests that the screen bottom board

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BEEYARD ... Cont. From Pg. 23

be contained in an enclosed box so the colony maintains warmer conditions thereby reducing *Varroa* populations. I have not seen the entire research paper, but due to the thoroughness of the observation, I thought that I would offer the researcher's concern.

However, Juan, another cold-climate beekeeper liked the screened bottom boards, but suggested modifications. He suggested, as did the researcher above, that the screened bottom board sit atop a frame and that the screen panel be housed in a grove – the whole contraption being enclosed. In this way, the screen could be removed for cleaning and the lower tray beneath the screen could be made sticky in order to capture *Varroa* mites that had dropped off.

Juan said, "*For me there is no further debate of whether or not these types of boards have merit. They are handy and serve as aid in cleaning chores. They are a perfect means to check on Varroa drop-offs. Mites cannot climb up because one can coat the board with sticky stuff if one desires. Mites are relatively far from the odor of nurse bees which is one of their attractants to mites according to research by the Winston crew. Field bees do not attract them although they are in closer proximity. These boards serve as ventilation adjustment thus draft will keep odors and heat up rather invading the lower environment.*

The new Boblentz 6-frame observation hive. Bees are on the bottom three frames.

I see no wasted time by bees ventilating at the entrance. The entry space at my hives is 3/8 height by 5 inches width. One eliminates much of the need for mouse guards at this entrance height. The obvious drawback is that bees tend to glue things together. Under those condition one has to dismantle the works to make it movable again."

Smoking cedar wood chips

Several Tennessee beekeepers use cedar wood chips that are sold for animal bedding as a pleasant-smelling smoker fuel. I bought a bag for $5.00 at a farm supply store and found that it worked well. The fire lasted a long time and was easy to keep going – once I got it going. As much as I can like any smoke, I liked this. Mind you, I still had to shower that evening, but at least it was a good smoky smell. I know, I know. Pine needles are free, but this is exotic. BC

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How Far Do Bees Fly?

Joe Traynor

One Mile, Two, Seven? And Why?

With growing concern about pollen transfer from genetically modified crops and with continued concern about pesticide poisoning of bees, it is becoming increasingly important to know the answer to the question posed above.

The flip answer, "as far as they have to" is also the best answer.

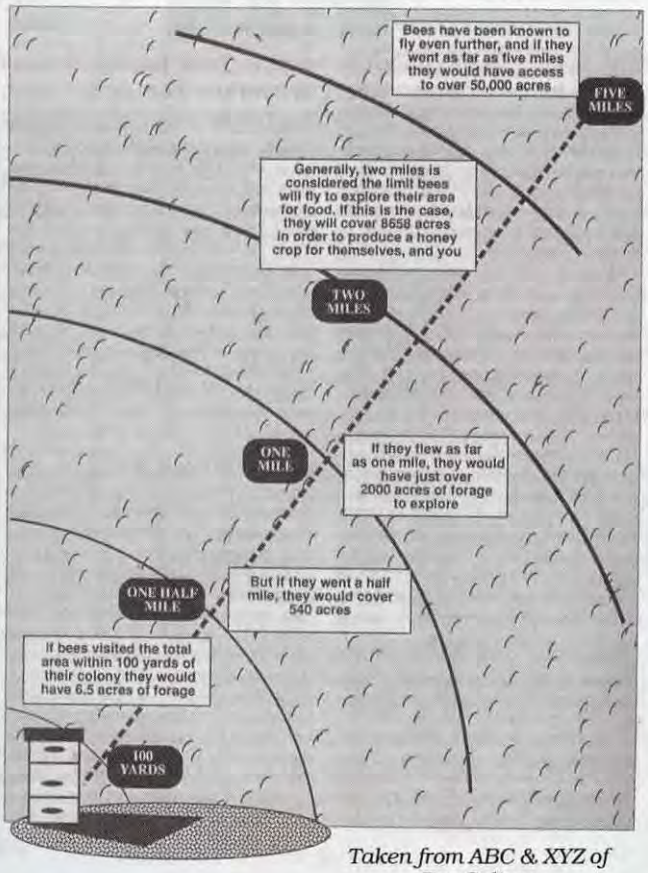
Imagine a large wreath of flowers, encircling a hive (or an apiary) in a barren desert. Gradually expand that wreath and you will find that bees will forage up to seven miles, but that the law of diminishing returns (where hives lose weight) kicks in at about four miles.

In what has been termed a "classic experiment" J. E. Eckert essentially did the "wreath experiment" in a three year study (1927-1929) that was published in 1933[1]. This study should answer the title question for all time. Eckert picked two irrigated areas in Wyoming that were separated by a 17 mile stretch of barren badlands, then placed colonies at increasing distances from the irrigated wares. Roger Morse summed up his study in the table on the next page.

What's striking about this experiment is that colonies can make a living when the nearest food source is four miles away. From this, it is easy to see that a two mile buffer zone is not sufficient to protect bees from pesticides (or to prevent pollen transfer from two different varieties of plants grown several miles apart).

The area covered by bees increases exponentially with distance from the apiary since the area of a circle is a function of the square of the ra*dius:*

Flight range	Acres covered
1 mile	2,011
2	8,658
3	18,092
4	32,166



Taken from ABC & XYZ of Bee Culture

I have had personal experience learning about the flight range of honey bees as determined by pesticide applications. Around 1981, bee colonies in an almond orchard in Kern county suffered severe poisoning from a spray (parathion) on blooming nectarines well over two miles away. There were approximately 5,000 bee colonies on 2,500 acres of almonds located over two miles south of about 200 acres of nectarines that were in full bloom. The poisoning occurred at the tail end of the almond bloom when pollination was essentially completed and when almond bees greatly expand their foraging radius. The bee kill pattern in the almonds conformed exactly to the distance from the nectarines: the closest bees, a little over two miles from the nectarines, showed a severe kill while bees four miles away suffered what would be considered a "light" kill.

Bees placed on alfalfa seed pollination will travel great distances to get pollen rather than work alfalfa flowers for pollen. In an extensive test in the 1980's, David Chaney (U. C., Davis) found that bees placed for alfalfa pollination collected 10 times as much safflower pollen as alfalfa pollen even though the nearest safflower field was five miles away![3] *a distance greater than the breadth of Celine Dion's ego!*[4].

California laws (and laws in some other states) require pesticide notification to beekeepers within a

Continued on Next Page

DISTANCES HONEY BEES WILL FORAGE

Distance from irrigated area (sweet clover and alfalfa)	Average change in Hive Weight over 18 days
0.0 miles	*+25.3 pounds*
0.5	31.6
1.0	23.3
1.5	21.3
2.0	18.1
3.0	13.8
4.0	5.1
5.0	-3.0
6.0	-6.2
7.0	-8.6

mile of hazardous spray. Since the nectarine incident described above, I have requested notification for sprays on blooming crops up to two miles away; my request has not been fulfilled and probably never will be although I have made it every year since the incident (saying, essentially, "attention must be paid").

A number of variables affect the hazard of a given pesticide application including the attractiveness of the sprayed crop, the total acreage to be sprayed and the dilution of bees (on other flower sources) in the area. When all conditions are right ("wrong" from the beekeeper's standpoint) severe pesticide kills can occur from sprays applied well over a mile from apiaries.

It is probably not practical to inform beekeepers of sprays within four miles, or even two miles of apiaries, but area-wide restrictions on pesticide applications could be made. These restrictions could ban the use of a few extremely hazardous materials (e.g., Penncap-M, Sevin, Furadan) in bee "areas" and restrict the use of others.

How far do bees fly? The answer still is as far as they have to. BC

Joe Traynor is a crop consultant and pollination specialist from Bakersfield, CA. He is a frequent contributor to these pages.

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Filling Your Buckets

Time, distance and reward are important in foraging.

Its raspberry picking time and you take a couple of buckets out to your favorite patch in back of your house. To your dismay, you find it overgrown with prickly nettles – there are ample raspberries underneath but it will be a chore to extract them. You start picking anyway but soon get discouraged; you sit down and calculate that it will take you all day to fill your buckets.

What to do? You then remember a raspberry patch you stumbled across a few years ago – its an hour drive by car, followed by a mile walk through the woods, but your appetite for raspberries has been whetted and you consider this only a minor inconvenience. You hop in your car, make the journey and after losing your way several times on the trail you finally arrive at the secret patch and discover, to your delight, a bumper crop of ripe raspberries that obviously hasn't been touched. You fill your buckets in 15 minutes and quicken your pace back to your car as you see someone approaching with a shotgun. You make it to your car and when you arrive back home you calculate that even though you just spent four hours, you'd still be picking raspberries if you'd stayed at the patch in back of your house.

Now, you're a worker bee in a hive surrounded by blooming alfalfa as far as the eye can see. As alfalfa nectar pours into the hive, your appetite for pollen becomes uncontrollable but you soon find that you have to visit 350 alfalfa flowers to get a load of pollen (about 20 mg)[1]. Alfalfa pollen is abundant (because of the millions of flowers per acre) and nutritious[2] but this is far different from that almond orchard this Spring where you only had to visit 20 almond flowers to get a load of pollen[3] and different, also, from that mustard patch you were in yesterday before some unthinking individual moved you last night. To add injury to insult, you get whacked on the head every time you get a smidgen of alfalfa pollen. Anything is better than this, so you fly zigzag upwind two or three miles to where you chance on a field of corn in full tassel. You land, and it only takes 15 minutes to fill your pollen buckets – you're in honey bee heaven!

When you get back to the hive, you use your language skills to inform your fellow workers of your (their) newly found bounty[4]. For the next two days you and your worker kin fill the hive with corn pollen and lift a cup or two each evening to toast your good fortune.

On the third day, you visit the corn field en masse and while you're in the midst of your chores, you see a low-flying plane approaching. Something buried deep in your genes makes you fell uneasy, but you go on with your work. You feel the spray drench you and find yourself twisting helplessly on the ground. As things get black, you hear a fallen comrade gasp with her dying breath, "there oughta be a law."

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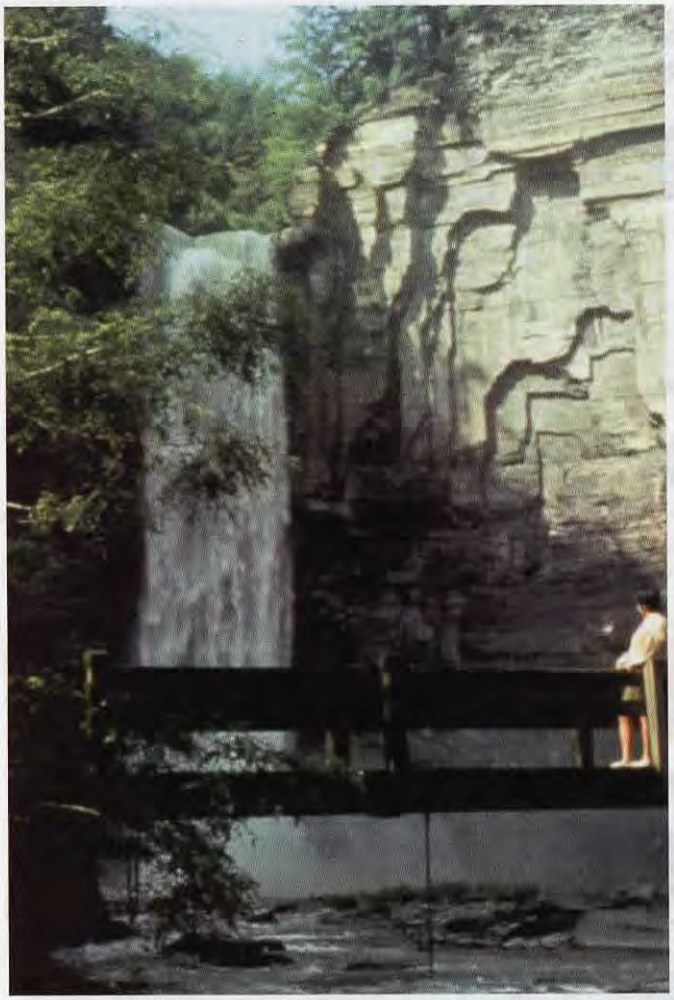

THE EASTERN APICULTURAL SOCIETY *Comes Back To Cornell University*

Richard Taylor

No beekeeper who can get here should miss the 47th annual meeting of the EAS (Eastern Apicultural Society) this Summer, for the plainest of reasons: Ithaca is the Mecca of beekeeping, the leading center for bee research, and at the heart of one of the great honey producing areas of the continent.

But that is only the beginning. You have to bring your family too, because this is one of the most interesting places on this planet Earth.

It is hard to know where to begin to describe it. I'll start with a bit of mind-boggling geology, as this is the background of some of the natural wonders you'll see, including the lakes.

Some time ago – about 380 million years, in fact – this whole area was a vast sea. When it eventually dried up it left an enormous bed of salt that now extends up to the area of Cleveland. Here the salt, deep in the earth, is so abundant that, just north of Ithaca, over three million tons are mined every year. Seemingly endless trainloads can be seen hauling it away, to end up on the highways far and wide to melt the Winter ice. The mining is done deep in the earth, with heavy machinery that is lowered in pieces through a shaft and then reassembled under ground. The mines extend right under and across the width of Lake Cayuga, whose southern shore is at the edge of Ithaca, and yet, amazingly, this lake, like all the Finger Lakes, is fresh water. This is the more surprising when one learns that people sinking wells of a few hundred feet, in their own yards, sometimes get salt water.

You could be here for a long time without becoming aware of the great salt bed, for there are few signs of it above ground. What you do see has far less to do with the ancient sea than with the glaciers that covered everything about 10,000 years ago. Their movement created the Finger Lakes as well as the deep gorges that are found on all sides, their streams flowing into the lake. One of these great gorges cuts right through Ithaca and the Cornell University campus. Another, a few miles north of Ithaca, on the west side of the lake, contains a waterfall higher than Niagara. This is a spectacular sight in the Spring, as the snows melt, but by late Summer it is usually little more than a trickle.

Those glaciers also, in receding, left layer upon layer of deposits filled with fossils. From time to time an ancient mastodon is unearthed. Highways have in some places been cut through these layers, so that fossil remains can be found just a few steps away. It is appropriate, then, that one of the great paleontological centers of the world, which is open to visitors, is here.

The overall effect of this ancient geological turmoil is a landscape of uncommon beauty, together with a series of lakes, the everlasting reminders of that past.

Lake Cayuga, in the heart of the Finger Lakes region, is one of the two largest, about 40 miles long. It is a 100 mile trip around the lake by car, through places bearing the names of Greek and Roman antiquity, like Romulus (there was once also a Remus), Aurora, Ovid,

Six Mile Creek Vineyard in Ithaca, NY. Part of the Cayuga Lake Wine trail with over 13 wineries.

Scipio, Ulysses and, of course, Ithaca itself. Some of the spots thus baptized eventually grew into significant towns and cities, like Syracuse. These names were bestowed by an early surveyor who happened to be a lover of the classics.

Over the years a few swimmers have risen to the challenge to swim the length of the lake, and at least once each Summer bicyclists, dozens of them, bike around it, in a swarm of wheels, up and down many hills, some of them steep and long. I watch them go by with deep envy.

In principle one could navigate from this lake to any port in the world. Yachts come and go from Long Island Sound, and a few move annually to Florida and then back. For several years my own maritime skills were tested on a little aluminum boat I picked up for $50, together with a little old outboard motor that I got for another $50. I tarred the bottom over to cover most of the leaks, painted the thing with aluminum paint and named her The Silver Streak. It got nearly five miles per hour at top speed, and my challenge was to get across the lake and back, to have lunch at an old inn over there, a round trip of about eight miles. Sometimes one of the huge yachts would glide by, and I could thus greet my fellow yachtsman with hand signals, the sign of our nautical solidarity. Once, when my little motor stalled, one of these tossed me a line and towed me back to my cottage, with much rejoicing on all sides.

Richard Taylor and his wife, Connie, will be at EAS 2002 at Cornell. Be sure and stop by and visit with them.

Ithaca is unique among towns of its size. Its population doubles every Fall with the return of college students, but the arts flourish the year 'round. We have what I believe is the only ballet company in upstate NY, plus repertory theaters and art galleries galore. There are over 50 artists in the area, joined by an art trail, but you don't need to embark on this to find galleries. Seven are right down town, within a few minutes walk, in the area of specialty shops and restaurants closed off to traffic and known as The Commons. Every kind of music can be found there and in the parks and churches, from small jazz combos to orchestral and chamber music.

This is also wine country, where varieties of grapes have been developed for wines that rival the best in the world. You can take an afternoon to drive the wine trail, up along the scenic west side of the lake, where the wineries, large and small, offer free tastings. This has become a great attraction to tourists, and it is my good luck to live right on this trail. Tourists come upon my honey stand in their quest for the wineries. If the wine trail tempts you, then I hope you'll stop at my stand. You can't miss it. I won't be there. I'll be at the bee meetings. No matter: The stand operates on the honor system, and you can leave a note for me, as just about everyone else does.

The bee meetings will surely include a trip out to the Dyce Laboratory for bee research, and if you happen to love birds you will find the Cornell Ornithological Laboratory less than a mile away. This is open to visitors, and it includes a trail through the preserve for bird watching. This is, I believe, the leading ornithology research center on this continent.

What else can you do here, besides mingling with beekeepers? Well, there are more good restaurants per square mile than any place I've ever been. Let me know if you want to try one and I'll offer recommendations.

I hope I've talked you into coming. Obviously this will be more than an occasion for beekeepers to refuel. It will be the perfect opportunity for a family vacation. Even if you do no more than take in the scenic beauty, you'll love the place. Everyone does. BC

The EAS Conference will be held August 5-9, 2002 at Cornell University. For more information contact Mike Griggs, 607.564.0656 or president@easternapiculture.org or visit www.eas2002.cornell.edu

A Glimpse of Richard's Honey House & the Finger Lakes

Steve Taber

In the Summer of 2001 a friend and I took an interesting trip from here in SC to NY State. It is cooler up there and I wanted to do some fishing anyway. So we headed up I-81 toward Syracuse. Upstate NY is really a very beautiful place, thanks in large to the glaciers that used to cover this part of the world. And the region called the "Finger Lakes" is very unusual because this was the only place I have heard of where the glaciers had to go up hill. All the natural drainage in that area is north, not like further west where the drainage was south through the Mississippi.

I wanted to go by and visit for a few minutes with an old acquaintance that used to write for this magazine, Dr. Richard Taylor. I called him first to make sort of an appointment and then dropped in. I wanted to tell him that I missed his articles in *Bee Culture* and that a mutual friend, Tom Ross, was soon to be operated on. And I wish to report to readers of *Bee Culture* that Dr. Taylor is well and healthy and enjoying life. In fact I think that Dr. Taylor was the very best writer about bees in my life time.

Once of the important aspects of that visit was his honey stand which he has written about many times. If you have never been up in that part of the world it is worth the trip to see his honey stand. The road by his house runs north and south and at least a mile in each direction he has signs by the roadside advertising "honey" then "comb honey" and more honey signs. The road by his house is well traveled by many tourists and the cars go whooshing by and there is no way or place to pull off. What you do is drive into a small lane, make your purchase and drive out. Dr. Taylor obviously likes his privacy so there is lots of brush growing, so much in fact it is hard to see his house.

After our visit to Dr. Taylor I wanted to show my friend the Taughanock Waterfalls as they are the highest in the eastern U.S. Of course there was a drought in the area so little water was trickling over the falls. However that was made up for while we watched the water come over the Falls of Niagara.

There must be a honeyflow on there in that area all Summer from the looks of the weeds growing along side the roads and in abandoned fields. And I even saw some fields of buckwheat in full bloom. That area used to be famous for growing lots of buckwheat but since the years after WWII the acreage of buckwheat is down.

It has been about 25 years since I have been traveling around the Finger Lakes and now there are lots of small wineries where you can stop and taste wines of different types. Unfortunately, I am not a wine buff so that after tasting a few, after that they all taste the same. My friend wanted to taste them all and buy lots of bottles of their wine.

One other stop we made was at the village of Union Springs that has a nice store selling used books. I asked the lady in charge did she have any "bee books." She didn't know but let's go look. Actually she did and she didn't, but I bought the book anyway because I like the author and I have read about him and some of his writings before. The books is entitled "Locusts and wild honey" and the author is John Burroughs copyright in 1879.

I first encountered Burroughs when I was working for a beekeeper in Roxbury, NY named M.E. Ballard back in 1942 who had at that time about 2,000 colonies. I found out that Burroughs was from this village and he did much of his early writing from a place he called "woodchuck lodge" or something similar. He had become a good friend with the auto maker Henry Ford so when Burroughs died, Ford bought the place and turned it into a memorial.

Anyway Burroughs was one of America's great naturalists and he wrote about bees. In my book I had just bought the first story is about "Pastoral Bees" and ends with this paragraph.

"Honey is honey the world over; and the bee is the bee still. 'Men may degenerate,' says an old traveler, 'may forget the arts by which they acquired renown; but the sweets of the wildflowers of the wilderness, the industry and natural mechanics of the bee, will continue without change or derogation."

And yes, I did some fishing. BC

?DO YOU KNOW?

Honey Bee Behavior

Clarence Collison
Mississippi State University

In some areas of the U.S., beekeepers will be in the process of extracting their Spring honey crops, while others are still dealing with the end of the swarming season and getting their colonies into peak condition for the upcoming summer flows. Whether you keep bees for pleasure or profit, one quickly realizes honey bees are truly fascinating insects. In many instances honey bees are very predictable, whereas in other situations we cannot explain why the bees behave in a particular way. The explanation of the activities and behavior of bees is not simple. As we increase our understanding of the factors and conditions that effect honey bee behavior, we should become more in tune with nature and better managers of our colonies. How well do you understand bee behavior and basic principles of colony management?

Take a few minutes and answer the following questions to find out how well you understand these important topics.

The first 11 questions are true and false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point unless otherwise indicated).

1. ____ The initiation of the swarming impulse within a colony is associated with congestion in the broodnest area, the age of the queen and distribution of "queen substance"
2. ____ The nectar collected by foraging workers can be fed to brood and adults directly.
3. ____ Most drones die before they mate with a queen.
4. ____ Brood pheromones stimulate the collection of nectar by foraging honey bees.
5. ____ Fluvalinate, the active ingredient in Apistan Strips® is more soluble in honey than it is in beeswax.
6. ____ Queens in colonies preparing to swarm produce less queen pheromone than those not preparing to swarm.
7. ____ The Russian lines of bees imported by the USDA ARS Baton Rouge Laboratory are proving to be resistant to both varroa and honey bee tracheal mites.
8. ____ SMR queens (Suppression of Mite Reproduction) have been developed by Dr. John Harbo, USDA ARS Baton Rouge from the Russian lines of bees that were imported in 1997
9. ____ Bees that are exposed to a crosswind on the way to a feeding site will adjust the solar angle when they dance, so that the information conveyed will point straight toward the goal.
10. ____ Honey bee queens gain weight as a colony prepares to swarm, since brood production is reduced.
11. ____ Foragers collecting nectar usually complete their foraging trip much more quickly than those collecting pollen.

(Multiple Choice Questions)

12. ____ Adult worker honey bees consume the largest quantities of pollen while they are:
    A. Guard Bees
    B. Nurse Bees
    C. Field Bees
    D. Building Comb
    E. Cleaning Brood Cells
13. ____ Two pheromones that are used by a swarm of honey bees as they ____ move to a new homesite are:
    A. Nassanoff Pheromone
    B. Isopentyl Acetate
    C. Footprint Pheromone
    D. Queen Substance
    E. 2-Heptanone
14. ____ Workers begin running back and forth in waves, buzzing to excite other workers is a behavior that occurs when a colony:
    A. discovers it needs to begin emergency queen rearing.
    B. is getting ready to issue a swarm.
    C. realizes that a new queen is emerging.
    D. is preparing to evict drones.
    E. has recently been invaded by a mouse, or disturbed by a skunk, bear or other animal enemy.
15. Name four factors that will affect the size of the honey bee foraging area. (4 points)

Listed below are three conditions that you might observe in a honey bee colony. Please indicate what actions should be taken. (1 point each).

16. The presence of white, freshly secreted wax along the lower edges of 3-4 comb top bars in the upper hive body.
17. You find five queen cells on the comb surface in a hive with two full-depth brood chambers.
18. In a four story colony, in the brood nest, you find multiple eggs per cell.

Please answer the following questions in reference to the adjacent illustrated communicative dance, as it is being performed on a vertical comb within a honey bee colony.

19. What is the name of the dance being performed? (1 point)
20. What information is being conveyed by the dance? (1 point)
21. Upon finding a colony with American foulbrood, you decide that you are going to kill the colony and burn the equipment. How would you legally kill the colony? (1 point)

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BEEING SAFE

T'Lee Sollenberger

DON'T LEAVE HOME WITHOUT IT!

According to my log notes on green box, number thirty-two, this colony is a new swarm, dating two weeks ago. At the time of installation, the queen was marked in yellow and I noted her coloration and banding. I carefully pry the migratory top loose with my hive tool. My smoker sits next to my right foot and drifts wisps of fragrant red cedar on a nearly windless summer morning. My notes mention that I collected these bees from a water meter box in the mid-cities. I have red-flagged it as possibly Africanized because of the swarm's location. It's a dangerous business collecting wild honey bee swarms in an Africanized area. Until the swarm queen starts laying eggs, the colony's final temperament remains a mystery. I am about to find out if these bees are friend or foe.

Wild swarms form thirty percent of my managed colonies. It's the main reason why I carry an auto-injector EpiPen with my first aide kit to my out yards. If I should be overwhelmed by a newly established colony, the EpiPen's epinephrine (adrenaline) will stave off anaphylaxis (should it happen) – the acute allergic reaction to bee venom.

At present, I react to bee venom in a mild way. Having been stung many times while tending my colonies. My body has grown accustomed to small doses of venom. Swelling is minimal, although minor itching two, or three days later at the sting site is not uncommon.

"It can take a lot of venom to make us toxic," says Buz Garrison, fellow beekeeper and emergency room doctor. "Anaphylaxis can kill you."

My benign reaction to the venom may eventually reach a toxic threshold and cascade into severe anaphylaxis months or years down the road. Carrying the EpiPen to my bee yards ensures that I will be able to deal with such an emergency should it materialize.

After my first EpiPen purchase, I read the simple, concise instructions enclosed. The EpiPen looks like a fat ball-point pen which contains epinephrine as a readily visible clear liquid. The pen is equipped with a pressure spring mechanism which releases the epinephrine. The instructions have an illustration which shows how and where to inject the epinephrine. It works like this: first, remove the pen from its yellow storage tube; pull off the gray cap from the pen; grab the pen around the middle being careful to keep your fingers or thumb away from the top of the pen; then quickly jab the black pen tip into the side of the heavy thigh muscles of your leg. This pressure causes the spring mechanism to release, immediately injecting 0.3 mg. of epinephrine intramuscularly. This arm's length location below the buttocks is the only recommended injection site.

The EpiPen shelf life is approximately two years if maintained at the proper temperature zone of 59-86° and kept in a dark location. According to the distributor, Dey, this temperature and light sensitivity is extremely important. Above 86° the epinephrine may precipitate out of solution or turn yellow which renders it useless. Temperatures below 59° compromise the Spring mechanism used to deliver the injection. This means I cannot store the EpiPen in my first aid kit or in my vehicle during the heat of the summer when I may need it most.

My solution to this dilemma is to pack the EpiPen in an ice chest above the beer and sandwiches! I place the EpiPen, box and all, in a Ziploc bag to protect it from moisture. I then store this in the plastic tray which came with my ice chest. To monitor the temperature, I tape an inexpensive aquarium thermometer to the pen box. I check it each time I open the ice chest.

The EpiPen is a prescription drug which is easily obtained by a short visit to my doctor's office. Because my family doctor knows that I keep bees and has noted "beekeeper" on my file, this allows me to call him later for a prescription refill without returning to his office when my EpiPen reaches its expiration date. An EpiPen prescription without insurance co-pay costs fifty-seven dollars. This may seem pricey, but the consequences of not having it could be far worse. And on some individual insurance coverage plans, the cost can be as little as twenty dollars. Dey also has a registration program in which they will notify me of the impending expiration date of the pen. It takes only a couple of minutes to fill out their form and mail it back.

The EpiPen, like all drugs, has a few potentially dangerous side effects. These may include: heart palpitations and arrhythmias, sweating, respiratory difficulties, weakness and tremors, headache, nervousness and anxiety. If you have cardiovascular disease, hyper-

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EPIPEN ... Cont. From Page 35

tension, hyperthyroidism, diabetes, are pregnant, or elderly, you may be at greater risk of developing adverse reactions after an EpiPen injection. It is best to carefully discuss these side effects with your family doctor before purchasing the pen.

So, what constitutes a bee venom emergency?

Garrison says, "There are two forms of bee venom emergencies: 1) the multiple sting toxic reaction one would see in an Africanized bee attack and 2) the systemic or anaphylactic reaction that can occur in the "allergic" individual by even a single sting. And these symptoms can be similar. The multiple sting toxic reaction can cause vomiting, diarrhea, dizziness, headache, muscle spasms, swelling, and even convulsions, causing a lot of pain. The anaphylactic reaction is a generalized systemic reaction – an allergic reaction caused by the release of pharmacologically active substances such as histamine which causes vasodilation, Urticaria (hives), and broncho-spasm. The signs and symptoms are a fall in blood pressure, vomiting, cramping, diarrhea, clammy skin, jittery-dizzy feeling, and hives to more serious symptoms of laryngeal endema (swelling of the throat), difficulty breathing, wheezing, and circulatory collapse." Some of these symptoms may take thirty minutes to an hour before becoming obvious. Shock and death may follow without immediate treatment.

Garrison suggests that if you have a history of severe localized or systemic reaction to just one bee sting in the past, not to hesitate to inject yourself with the EpiPen at the first onset of an attack by bees. The EpiPen works quickly, usually within a few minutes there will be a lessening of the symptoms, but it is not a cure all. You must either call an ambulance, or get to a hospital emergency room for further treatment and monitoring after such a life-threatening incident.

I completely remove the top of nuc thirty-two with smoker in hand should I need it. A few curious bees fly out to investigate, the rest mill around on top of the frames ignoring me. I loosen and lift a frame of well-pulled foundation and check for eggs, larvae and capped brood. All are apparent. The bees fly around my head, land on my suit and crawl around on my gloves inspecting me as much as I am inspecting them. I am pleased by their gentle behavior and give this colony a tentative four stars rating. No need for an EpiPen today!

For me, beeing safely only makes sense. I am frequently alone working in my out yards, monitoring new colonies, and checking for problems. The EpiPen is like having a fire extinguisher, it's there if I need it, but hopefully I'll never have to use it.

For more information about the EpiPen, contact Dey's customer service at 800-755-5560 or discuss the EpiPen with your physician. BC

T'Lee Sollenberger is a sideline beekeeper, who believes in being safe.

Ed and Dee Lusby

of Tucson, Arizona, are at the center of both a growing controversy and a new

philosophy of keeping bees in the U.S.

The emphasis Ed and Dee place on feral bees, their ideas about the effect of honey bee worker cell size on bee health and vigor, and their promotion of a 'natural' 4.9 millimeter cell size run contrary to conventional wisdom in the beekeeping industry and seemingly seek to undo a century of progress in North American and European bee breeding.

The apparent success of their bee operation without any use of chemical treatments is truly remarkable at this time when many beekeepers feel that the experts are running out of answers and that we need to escape the pesticide treadmill. Therefore, when Dee invited us to visit and see for ourselves, my neighbor, Joe, and I jumped at the chance; we stopped by Lusbys' when we were in Arizona for the American Honey Producer's convention in January,2002.

When we arrived at their gate in a Tucson industrial area, Joe and I expected to spend a few hours and go on our way, but, as it turned out, we spent three very full days with the Lusbys and their bees. During those three days, we helped make foundation by hand, visited seven of their yards in the remote Sonora Desert west of Tucson, opened over 100 hives, closely inspected about 30 of those hives, and had a chance to hear many of Lusbys' ideas explained in detail – and to debate some of the fine points.

We had a wonderful time. We discussed bees from morning to night, and learned how quickly Dee can pull out tapes and documents from their extensive library when they are needed to support her ideas.

On our first day, we examined the bees at their yard in town and made foundation with Dee using a manual dipping technique and a hand mill. On the second day, the Lusby's, Lee (a beekeeper friend of Lusbys from New Mexico who also uses 4.9 foundation), Joe and I headed west towards the mountains in their rugged, desert-customized Chevy van to see how the bees in the distant yards were doing.

Although Lusbys keep a few hives in their Tucson work yard, most of their hives are located on remote desert ranches over forty miles from the city, measured as the crow flies. By road, the journey is more like 60 miles to the nearest yard, and after the first fifty or so miles, the last few are rough miles, requiring a tough, high clearance four-wheel drive vehicle.

Since it was Winter, Ed and Dee had not been to some of their yards for a while and they found our visit a good excuse to make sure everything was okay in the distant locations. Periodic visits are necessary since animals such as coatimundi, a raccoon-like high desert animal, or hunters from the city sometimes overturn or damage a few hives. Sure enough we did find a few hives down, several from animals and several from two legged varmints. We also observed the scratching at hive entrances that is characteristic of skunks or coati, and bullet holes and four-wheeler tracks that are characteristic of some kinds of hunters.

Most hives were okay when set up again, but one or two had been robbed out. In spite of that, the bees in most yards were not especially cross. Dee placed small, sharp rocks around the entrances boards of the hives the animals had singled out and said that usually stops the scratching by making the ground too uncomfortable for the coati. Not much can be done about humans, although the gates are locked and the area patrolled by ranchers and by the Border Patrol.

We spent two full days looking through Lusbys' yards, and in that time we saw lots of good-looking bees and brood, one small swarm which left for parts unknown while we watched, no significant brood disease, and very few *Varroa* mites. With Ed and Dee's encouragement and assistance, we opened hives more or less at random, both in their home yard and in their desert yards. If Joe or I saw a hive that we thought might be in some way different or interesting, we opened it.

We were in Tucson in mid-January, and the weather was mostly in the 70s. Some nights got down close to freezing, and the chill lasted well into the morning. Tucson had snow not long after we left.

Since January is Winter in Tucson, the hives were not at full strength. At times we found the bees clustered, depending on time of day and the location. In most yards, there was a light flow coming in and flight was usually underway by noon.

The clusters varied from a couple of frames up to a couple of boxes of bees, with about five frames of bees and several good frames of sealed brood being the median size. We made note of some hives that need splitting soon, and saw one small swarm on a low bush when we entered the yard. It was obvious by the surface bee activity on the swarm that they were about to leave, and sure enough, we were unable to hive them. They left, headed west.

All Lusbys' hives are well maintained and on individual floors in two rows in each yard. With few exceptions, each hive, no matter how small or large, is kept in four standard boxes. This keeps the supers safe from moths and allows room for the bees' normal explosive Spring growth. Having lots of room means there will be no Spring rush to get boxes to the field (the roads could be washed out), and no danger of triggering swarming by overcrowding the better hives. In the desert near Tucson, the climate is mild enough that the bees don't mind the extra room. Most hives were raising brood in the second box when we examined them, leaving the bottom and top two boxes less occupied. In many cases, the top boxes were foundation.

On average, each hive we examined had only a frame or two of feed, and very little nectar around the brood compared to what Joe and I are used to maintaining in our colonies in Western Canada. Joe com-

A DESERT STORM

Allen Dick

mented that the hives were a bit short on feed by our standards, but we are from the north and in the Tucson area, unlike Alberta, flows come and go all year. Moreover, Lusbys deliberately breed for bees that can support themselves and do not care to encourage uneconomical queens. Although they gave occasional frames of honey to hives that were getting established, they don't feed whole yards as a routine practice the way we do up north.

Although the bees were not as tame as some Caucasians I have owned, the Lusby bees seemed quite docile to me compared to the Australian and New Zealand imports and Hawaiian offspring we manage in Canada, and I teased Dee about having 'wimpy Killer Bees' since the authorities claim that Arizona is 'Africanized' Dee has other theories about the origin of their bees and the dominant genetics of the bees they manage. Maybe Lusbys' bees are worse when they build up for Summer, but in terms of temper, I found them pretty much exactly what I have come to expect when visiting yards through Alberta during 30 years as a commercial beekeeper and, years ago, as a bee inspector.

Although the Lusby bees were not particularly defensive, and did not run on the combs or attack en masse, they seemed quite quick-moving and hardworking. With few exceptions, they stayed nicely on the comb when we worked them and did not seem much disturbed by our examination. We did, however use smoke constantly to ensure that we did not need to suit up completely and the bees responded very nicely to the smoke. The fuel was bits of wood from desert shrubs that we found and chopped up into small bits. Although the wood seemed quite hard, it smoldered well, made good smoke, and did not go out.

The brood patterns we encountered were, almost without exception, very solid and well laid. Adjacent pupae and larvae were always the same age, a sign of fertile and active young queens. Any queens we saw tended to be mostly black.

Dee raises queens from their favorite stock, which is kept at some of their most remote yards. When raising queens, she hatches the virgins in an incubator, examines them, mates or introduces those she thinks are good, and makes up a swarm lure mixture by crushing the ones she does not like. She selects queens by looking for color, shape, and particular markings that mean to her that the queen carries the characteristics she seeks. She says that she likes the queens she calls 'Tootsie Roll queens', and calls them that due to their unique brown markings.

When installing virgin queens, she just smokes the hive so that smoke is coming out all over, then runs the virgin in. Some types of bees will kill queens introduced this way, but Dee says the strain they have accepts the virgin if it is done right, and the virgin will mate and lay alongside the original queen in most cases.

In addition to this tolerance of extra queens, Dee claims their stock has other unique characteristics. She and Ed have observed that thelytoky is a distinct trait in their bees. Reportedly, previous generations of the Lusby family were also aware of this characteristic in their bees and have always regarded it favorably. Thelytoky is the characteristic that allows unmated worker bees to lay fertile eggs that develop into females, *not* drones as one would expect. Thelytoky permits hives that would normally be hopelessly queenless to requeen themselves using worker eggs, and Lusbys claim their bees often do just that.

As we worked through the hives together, Dee pointed out that she considers it important to have at

You had to look hard to find Varroa, *and then it would only be one/cell.*

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A DESERT STORM ... Cont. From Pg. 39

least one sub-family of small black bees in each hive. We looked, and, yes, there seemed to be a correlation between the better hives and the presence of at least a few small black bees.

She said that a black contingent is necessary in each hive to have the hive exhibit the *Varroa* and disease resistance they seek. I gathered that it is not just any black bee she wants, but she is looking for particular characteristics that are apparent to her. In one particular hive at a distant location and a higher altitude (3,470 feet), I saw remarkable little black bees with wings longer than the bees – to the extent that the wings actually stuck out behind the bees. My camera was not available and I regret not having taken a picture. I guess I'll have to go back sometime.

Joe and I were particularly interested in seeing for ourselves the *Varroa* and tracheal control without chemicals that Lusbys attribute to the use of 4.9 mm foundation, and we were not disappointed. We were unable to evaluate the tracheal resistance, other than deduce success from the fact that the bees were thriving. Tracheal mite load analysis requires dissection of bees, but *Varroa* is easier to see, and normally the results of untreated hives being exposed to *Varroa* are predictably sad. Hives that have not been treated for *Varroa* for years – if ever – should be dead. These hives definitely were not dead.

Although, by careful searching, we did find a few *Varroa*, not one of the 20 or so *Varroa* we found in that whole time was phoretic (on an adult bee). Moreover, not one mite in any cell we examined appeared to be reproductive and every mite we saw had already been located by the bees and made obvious to us by the fact that the bees had uncapped the cell.

In some hives, the bees had uncapped a few cells here and there on patches of capped brood. The only mites we found were in uncapped cells, and those cells appeared to be at some stage of being cleaned out by the bees. In those few uncapped cells, we would almost invariably find a single foundress mite all by herself on the pupa, usually at the colored-eye stage.

Some of these cells were just uncapped and others were partially emptied. Where the cell was only uncapped, Dee said that the mite had been on the head of the pupa. Where the pupa was chewed down, the mite was assumed to be further down. When we pulled out such pupae, we always found the mite.

We never saw more than three or four of these opened cells on a frame. Out of curiosity, wondering if the bees were smart – or just lucky – we opened the capped cells around some of these cells with uncapped pupae where we found a mite. We *never* found a mite in a surrounding capped cell, or any capped cell for that matter. We also observed that as we withdrew the contents of cells on a straw, nearby bees would immediately investigate what we had on our probe.

Since it was Winter, there was no noticeable drone brood at the time of our visit, although Lusbys deliberately encourage up to 10% drone cells on a frame by having the foundation stop about three eighths of an inch above the solid bottom bar. Therefore, we were unable to examine drone brood for mites, but I doubt we would find many.

Lusbys' claim their foundation is the key to their success, since it allows the bees to make cells smaller than the cells made by bees housed on most commercial North American or European foundations. Their foundation is made by hand from chemical-free wax in their own shop using a hand mill, and Joe and I helped Dee make about 65 sheets from scratch in two hours or so. (We'll be detailing the process in a future issue.)

The cell bases impressed on the midrib of Lusbys' style of foundation measure slightly less than 4.9 mm across on average. Lusbys prefer a foundation with no cell wall, but a fairly thick base, and they say the bees use the wax from the midrib to make the first third of the cell. Lusbys use no vertical wires, but do use four horizontal wires, which are strung tight and which they crimp with a European-style hand crimper.

The frames we saw them converting to 4.9 were mostly recycled from their previous combs. After moving from conventional 5.3 and 5.4 mm combs down to 5mm, they decided that the larger comb – even 5 mm – was just not working for them, and have melted almost all their larger caliber comb down to refit the frames with 4.9 foundation that is made from the melted combs.

The used frames have been tightened and rewired if necessary and are as good as new. To install the wax sheet, they lay the wired frame flat and connect to the ends of the wire with electrical contacts. An old iron element functioning as a resistor drops the line voltage and limits the current to what is needed to heat the wires. They settle the wax onto the wires and press the wax to the correct depth onto the hot wire with a deft motion of the hand. The result is a tight, flat sheet of well-embedded homemade 4.9 foundation. I saw these sheets on the hives both drawn and being drawn, and was impressed at how well it is drawn and how flat the combs stayed. The homemade foundation is very good.

The Lusby family has been in bees for generations, and Dee has worked with bees since she was a girl. The family takes their beekeeping seriously. It seems that almost all activity in their home revolves around the bees and bee books. Over the last decade, Lusbys suffered twice through high bee losses, once from tracheal mites and once again from *Varroa*. These losses were exacerbated by serious droughts in their area. Through all this, they have maintained their belief that with the correct management and selection, bees can survive and thrive without chemical aids or use of expensive and fussy proprietary purebred queens, if they are selected and managed properly. It seems they now have succeeded in finding a system that works for them.

Since the days of heavy losses, Lusbys have steadily built their hive numbers back up and are now at a point where Dee and Ed dream of sharing their success, their stock and their ideas with as many other beekeepers as they can. While they don't want to see their stock patented or exploited, they would like to sell nucs when they have surplus bees, and that could be soon.

They are producing honey again and are able to offer their product market as totally chemical-free. I think we all would like to be able to do the same. BC

Allen Dick is an on again, off again sideline/commercial beekeeper and active on the internet, from Swalwell, Alberta, Canada.

MOBILE BEEHIVES

James E. Tew

I don't know what it is about beehives. Even if you have only one, sooner or later it will need to be moved. At this point, hundreds of memories flash through the thumbnail viewer of my mind – rain, darkness, bearding bees, bottom boards dropping off, lost hive tools, weak flashlight batteries – all punctuated with the sounds of questionable language. By design are all beehive relocations a disaster? Nope, not if you plan ahead and have some good luck.

Years ago, I wrote a descriptive piece called *Moving Bees and Other Frightening Stories* in which I relived several harrowing beehive moving experiences. I don't want to do that here. Rather, I choose to use my experiences, and those of many others, to make suggestions on how to smoothly move colonies.

Variables of all hive moves

The following variables affect potential hive moves. Each variable should be dealt with appropriately.

Hive Move Variables
1. Distance of the move
2. Weather (or time of the year)
3. Hive population (or colony weight)
4. The old yard's location (loading difficulty)
5. The new yard's location (unloading difficulty)
6. Friend availability

Long trip vs. a short trip

How far do you have to go with the hives? Obviously, long moves are more challenging than a local one. Essentially, the local move is more conducive to sloppiness. You don't have to pack the colonies as tightly. You don't have to tightly close the entrance or provide for a top screen (for ventilation). You can do a better job of choosing your weather ("*It's raining tonight so I will do it tomorrow night.*") or you can more readily justify other risks ("*My truck is old, but it will take the short trip okay.*")

But having said that, if you want the short trip to go as easily as possible, load the bees as though you were moving them 500 miles. It's more work, but you can't go wrong.

An experienced friend as a helper

An experienced friend who will help you move colonies is more difficult to find than Jumbo-depth frames. Even so, you need to search for one. You should know that, at times, you may become the friend of another beekeeper with a moving problem. Though the years, I have gone through brothers (I have no sisters), cousins, parents, uncles, distant relatives, and casual friends. I am pretty much at the point now where I must use money to find someone to help with a move. Make no mistake – moving established hives is hard work[1]

Oh alright, I'll just do it myself

That decision is made a lot. Sometimes you just can't find another to give you a hand. Ironically, the basics of hive moving are pretty much the same whether or not you have someone to help. Take a cell phone. That is a luxury solitary beekeepers didn't have just a few years ago. I suppose in a few more years, we will all have GPS technology (Global Positioning System) so we can let the entire world know where we are having problems.

Your hive equipment

Ideally, your equipment should be in sound shape – no holes, no rotten corners, no broken bottom boards and solid tops. For dependable moves, colonies should be screened – entrance *and* top – especially for strong colonies. Chilling a hive is rarely the problem – but the potential for overheating a confined colony is a rear danger.

Using either straps, staples, or wooden battens, the colony should be secured as a unit. Do not depend on propolis holding the hive together (unless you want to acquire your own Moving-Hive stories.) The photo of the single story shows a colony that is top-screened with 8-mesh hardware cloth – entrance and bottom (aluminum window-screening). The top screen is held in place with long screws as is the entrance screen, which could have been stapled on. Brick straps were screwed to the bottom board and hive body, on both sides and the back, to secure the hive to the bottom board. This also shows a beekeeper-built custom entrance closing device. The extra space above the entrance allows the bees space to cluster should the colony become hot.

More common than the entrance-closing device shown there however is aluminum window screening used to close the entrance (see the other photo). Cut a piece about 4" wide and about 2" longer than the entrance. One end of the cut piece is folded at a point where it exactly fits in the entrance lengthwise. Then, the end-folded piece is lightly folded down the longitudinal center and is pushed into the entrance. Normally the "spring" of the lightly folded screening is enough to hold it in place. If you have doubts about it staying in place, staple it a few times.

In the same photo, a ratchet strap, available nearly anywhere, is used to hold the colony together. I suspect this combination of ratchet straps and window screening are the two most common devices used to prepare a hive for a short move. For a longer move, a top screen should be added to the mix. The two-story photo shows an example of a strapped and screened 2-story colony readied for a move.

[1] For a pervious article on a solitary commercial beekeeper who frequently moves hives, see Tew, James E. *15 Colonies and 1 Pickup. Bee Culture*, November, 2000, http://bee.airoot.com/beeculture/00nov_bak/00nov3.html

A single story hive, ready for moving. (James R. Tew photo)

A strapped and entrance-screened colony.

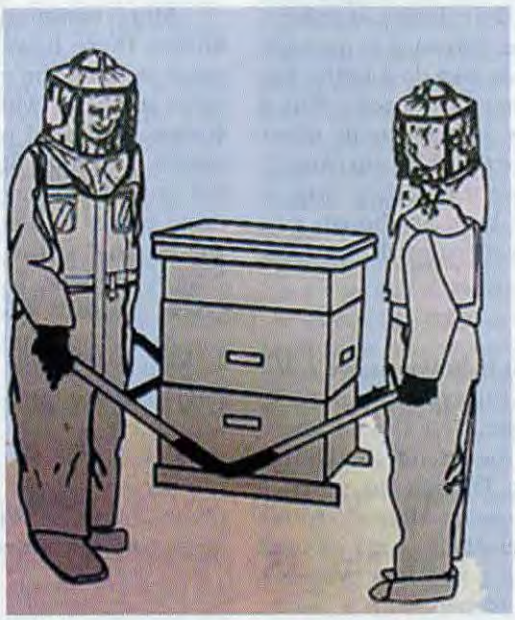
Commercial beekeepers use plastic nets to cover the entire load when moving hives long distances. Such netting is expensive and is beyond the economic reach of most smaller beekeepers.

Picking up the hives

I have harped and harped about the fact that our beehive design is not perfect. My opinion of the primary imperfection is that is that two people are required to lift one 2-story colony. That imperfection comes into play at this point. Without a doubt, the most strenuous aspects of colony moves are getting the hives onto and off of the truck (or trailer or out of the car).

Unless you are exceptionally strong, don't attempt to lift the hive manually. In years past, I used a low trailer and a ramp. I hand-trucked the hives up the ramp onto the low trailer. In even more years past, I had (and still have) a bumper mounted lifting crane attached to my truck. While this device looked great on paper, it required locating the truck near by in order to get the hive close enough to lift it. Presently, my bee lab truck has a hydraulic-lift tailgate. It really makes life easier.

I can't be more blunt – getting the hives on and off the truck is work. Specialized truck equipment is beyond most of us. A combination of hand trucks and ramps will probably meet your needs. Now, having said that, a hand truck – loaded with a heavy hive – can be highly unstable. The wheels are too close together, but if I conceptualized a hand truck with a wider wheel base, hence more stable, it would be difficult to maneuver it in the confines of the truck (or trailer). I am looking for good ideas on this point. If you have one, I would be happy to learn about it.



A Katz Super Hive Carrier (from the Walter T. Kelley Company).

Hive carriers

I know that I postulated that I would be discussing a single-person move, but 2-person hive carriers need to be mentioned. Such carriers, in someway, clasp the hive and temporarily provide handles for moving the colony. The diagram shows a commercially manufactured hive carrier in use. They work well is you have two people.

One way or another, the hives are on the truck

By now, you are tired and are trying to remember why you ever even became involved in beekeeping. But don't slack. The frequent tendency is to get the hives on the truck and take off – *It's only a short drive.* Squelch that tendency. The most unexpected things can go wrong. One dark night, I was stopped by a State Highway Patrol officer who was unaware that I had open, un-restrained hives on board. I was promptly sent on my way with a quick admonishment. More often, the problem arises when the path to the new location is rough, requiring bouncing and banging the hives in the process. A bottom board only must slip a small amount to allow frustrated bees to escape. (There goes the loss of another friend.) So, again, I strongly recommend that you secure the hives, with braces or straps, *within* the truck (or trailer). Getting the hives onto the truck is only half the process.

Picayune Suggestions

for making hive moves go easier

1. Have a good, big flashlight (and a spare one).
2. Always, always lay your hive tool and smoker on top of a colony when working after dark.
3. Have a roll of duct tape handy. Have two.
4. For longer moves, take a water hose to wet down hives should they begin to overheat (that you can hook up at a filling station).
5. Have basic tools for repairing or refitting hive closing devices.
6. Have multiple packs of matches and readily available smoker fuel.
7 Know where you are going. Landmarks look different in the dark.
8. NEVER depend on propolis to hold a colony together during a move.
9. Only use protective gear that is in perfect shape.
10. Take something to drink (Non-alcoholic).

Must hives be moved at night?

Hives *can* be moved during the day. Naturally, some part of the field force will be lost, at no small cost to the hives. But moving hives during daylight hours is easier in some aspects. Many times, a beekeeper will leave a hive or two to pick up the field force of returning bees. Later, the remaining hive or two are moved – all much easier than moving larger numbers of hives at night.

The downside of daylight moves

Obviously, you will need to make two trips if you leave catch-colonies at the old location. A second trip may or may not be practical. Secondly, during daylight hours, you will have a lot more of society with which to deal. Traffic lights, school buses, and congested traffic can make you more apprehensive. Under the cover of night, you can hide more of what you are doing – so you are exposed to fewer people, but you must work in the dark.

Not as bad as it sounds

Moving hives is not as bad as I have made it sound, but the uneventful beehive move is rarely discussed – only those moves that blow up get coverage. Be prepared and be confident. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu

EDIBLE FLOWERS

Ann Harman

This Summer, make the bees share some of their blossoms.

The mention of honey bee plants usually brings to mind plants that bees visit, gather nectar (pollen also) and turn that into honey. Hobby beekeepers like to search for the plants their bees will like. But human beings can use bee plants for something else – *our* food. I do not mean that we will go out, wander about acting like scout bees and find a plant to munch on. I mean that we are going to do something delicious with the plants usually associated with honey bees.

These recipes do not necessarily use honey. And not every plant a bee prefers is going to contribute something delicious to our diets. So let the bees make their choices and let's see what we can make with some of their favorites.

The mint family, Mentha spp., is popular with bees. If we let our mint beds bloom, the delicate purple flowers bring bees by the hundreds. Mint, as gathered by man, is used as a garnish for ice tea and some other beverages. But no beverage receives as much attention for the mint as a mint julep. The mint julep is, of course, THE drink of the Kentucky Derby, run in May. I am sure more mint juleps are consumed in the US on that day than on any other day. However, one does not need the excuse of a famous horse race to enjoy a mint julep on a warm summer day.

Recipes for mint juleps do agree on some aspects. The best container is said to be silver, holding about 12 ounces. Only the best bourbon should be used. The mint must be selected carefully – tender, terminal mint leaves. The ice must be finely shaved or crushed. The outside of the container should not be touched except by the person intending to drink the julep.

After this, every recipe you can find disagrees on the proper procedure. Some chop the mint, some bruise the mint, some leave the mint whole. I will leave the treatment of mint up to you.

Chill the container. Then place 4 to 6 leaves (no stems) in the container along with a teaspoon of powdered sugar and a teaspoon of water. Muddle very well. Fill cup with finely crushed ice. Pour in one jigger bourbon. Stir vigorously with a long spoon. Frost should start to appear on the sides of the container. Add more crushed ice almost to top of container and pour in another jigger of bourbon. Churn this mixture again. Top with a sprig of mint.

These instructions are really a composite of several ways of preparing a mint julep. They can be modified. One thing is certain, however – the bee really does not care what you do to the mint.

The dandelion, *Taraxacum officinale*, is beloved by bees, and we hope by beekeepers. Certainly the cheerful yellow flowers show us that Spring has arrived. However, the dandelion is *flora non grata* in urban and suburban lawns which, we are told, must be an expanse of pure green grass. What do bees do in those circumstances for their early Spring nectar and pollen, so important for raising more honey bees for our future honey harvest?

In some countries the dandelion is considered a source of honey. However the honey has been described as having a strong flavor. The only time I collected dandelion honey I thought it tasted like butterscotch. The color of dandelion honey is a rich gold, no doubt colored by the profuse pollen. Beeswax made at the same time as dandelion bloom is a beautiful yellow color. The honey does crystallize rather quickly so if a crop can be obtained it should be removed before it crystallizes in the comb.

Dandelion greens, gathered when young in early Spring can be used in salads where their tangy flavor can be appreciated. Old leaves tend to be bitter. But what about the blossoms? Here you have a choice – leave them all for the bees or gather some and make dandelion wine.

DANDELION WINE

1 gallon flower heads
2-3/4 pounds sugar
1 orange
2 lemons
1 yeast nutrient tablet, crushed
10 –mg vitamin B1 tablet, crushed
wine yeast
1 gallon water

Bring water to boil, stir in sugar to dissolve. Thinly peel the orange and lemons (discard the pith), place peelings plus dandelion flowers into plastic bucket and pour the hot syrup over them. Cool to 70°F add juice of the fruit and other ingredients. Stir to dissolve tablets. Soak for two days, strain into gallon jar, top up with water, and continue fermentation with air lock. Rack when clear. Bottle when ready.

Winemaking As A Hobby
Pennsylvania State University

The life of the apple and the life of the honey bee are closely linked, although the bee can and does find substitutes for those early blossoms. We are all familiar with the pictures of badly-pollinated apples – lopsided, just not fully formed. A modern, densely-planted orchard is highly dependent on honey bees for pollination. Morse and Calderone, in

Continued on Next Page

FLOWERS ... Cont. From Pg. 45

their year 2000 pollination study, estimated that 275,000 hives are used each year for apple pollination. The bloom is early thus providing bees with both pollen and nectar for increasing brood. A honey crop from apples, in most areas, is not practical. Lovell, in his 1926 book, states that apple honey "is pale yellow, with an agreeable flavor, and granulates quickly." Let's leave it for the bees.

The number of apple varieties around the world is astonishing. Even those listed in a nursery catalog do not come close to the number of varieties actually grown. The popularity of apple varieties has changed over the many years the world has grown apples. A visit to a large supermarket shows the latest consumer choices in apples. We can have a rainbow of colors from almost black-red, through orange-red, to green, some striped ones, too. And we are offered a choice of eating textures – soft and sweet or crisp and tart. The bee rewards us with apples for cooking and apples for eating. Thanks to modern refrigerated and atmosphere-controlled storage, we can eat a superb apple any month of the year.

Here is a recipe that uses apples. Thank a honey bee and give this one a try. If you use it for a potluck this summer make certain your "eaters" realize their debt to honey bees.

CIDER WALDORF SALAD

2 envelopes unflavored gelatin
2-1/2 cups cold apple cider or apple juice
1 cup apple cider or juice, heated to boiling
2 tablespoons lemon juice
1-1/4 cup chopped apples
1/2 cup diced celery
1/2 cup raisins
1/2 cup coarsely chopped walnuts

In a large bowl sprinkle unflavored gelatin over 1/2 cup of the cold cider; let stand one minute. Add hot cider and stir until gelatin is completely dissolved. Stir in remaining cold cider and lemon juice. Chill, stirring occasionally, until mixture is consistency of unbeaten egg whites. Fold in remaining ingredients. Turn into 6-1/2 cup mold or bowl, and chill until firm. Garnish, if desired, with sliced apple. Makes about 12 servings

APPLES ... Rappahannock Style
Rappahannock County Extension

Another fruit crop that uses migratory bees for pollination is the blueberry. Whether highbush or lowbush, cultivated or wild, blueberries need bee pollination. Blueberry honey is also a much appreciated result of bees being placed in blueberry fields. The honey is amber with a rich, pleasant flavor. Blueberries themselves are rich in vitamin C and recent research has shown that they are an excellent source of antioxidants, better than 40 other fruits, juices and vegetables. So it is no wonder that blueberries are increasing in popularity.

Blueberries make pancakes and waffles better and blueberry muffins are always popular. Fortunately blueberry varieties assure us of early, middle and late season ripening so the harvest time is prolonged. This gives us more chances to use blueberries. They freeze well, also, so our season can be extended to all year around. Blueberries combine well with other fruits including cranberries. If you are going blueberry picking, remember that red (unripe) or green blueberries will not ripen after being picked.

This recipe is quickly made, good for a busy summer day. You will want to serve it with some ice cream.

JULY CRISP

4 cups blueberries
1 cup quick oats
1 cup flour
1/2 cup sugar
pinch salt
1 teaspoon cinnamon
1/2 cup butter or margarine
1/2 cup pecans or other nuts, coarsely chopped

Combine flour, sugar, cinnamon and salt. Add butter and blend to make a crumbly mixture. Add oats and nuts. Mix about 1/4 of the crumb mixture with the blueberries. Place in a buttered dish. Cover with rest of crumb mixture. Bake at 350° for about 40 minutes.

The Blueberry Connection
Beatrice Ross Buszek

Bees love clover blossoms. Fortunately the clovers (and there are many) produce a mild, pleasant honey that is very popular. But we can also use a few clover blossoms ourselves in our cooking. This next recipe uses those blossoms, along with others that bees love.

CONFETTI BISCUITS

1 tablespoon mint blossoms, chopped
1 tablespoon clover blossoms, chopped
1 tablespoon chive blossoms, chopped
1 tablespoon dandelion blossoms, chopped
1/4 cup cottage cheese
1/3 cup milk
3 tablespoons vegetable oil
1/2 cup whole wheat flour
1/2 cup unbleached white flour
1/4 teaspoon baking soda
1/4 teaspoon salt

Sift dry ingredients together. Mix cottage cheese, milk, and oil together in a large bowl. Stir in chopped flowers. Add sifted dry ingredients. Mix well. Turn out onto a floured surface and knead for several minutes. Roll dough to a thickness of 1/2 inch. Cut with a biscuit cutter and place on ungreased cookie sheet. Bake for 12 to 15 minutes at 450°, until lightly browned. Makes 10 to 12 biscuits.

Edible Flowers From Garden To Palate
Cathy Wilkinson Barash

I am sure the bees won't mind sharing a few blossoms with us. BC

Ann Harman is a sideline beekeeper and international marketing consultant.

?Do You Know? Answers

1. **True** Swarm preparations is an extraordinarily complex function involving coordinated activities by thousands of individuals. Initially, queen rearing preparations are started when conditions are favorable for swarm production. The primary stimuli, none of which would initiate queen rearing independently of others, include colony size, brood nest congestion, worker age distribution and reduced transmission of queen substance. We also know that the age of a queen contributes, since the older the queen the greater the probability of the colony swarming.
2. **True** The nectar collected by foraging workers can be fed to brood and adults directly, but it is more commonly processed into honey first.
3. **True** Although drones exist only to mate and perform no other useful functions in the nest, most die before mating, either because they get old or are thrown out of the nest by the workers.
4. **False** Pollen foraging behavior is regulated by two factors: stored pollen which results in the inhibition of pollen foraging, and brood pheromone which stimulates pollen foraging. When young larvae are rinsed with a solvent like hexane, chemicals wash off their bodies that are stimulating to foragers. When these chemicals are placed into colonies, the number of pollen foragers increase dramatically and instantaneously, demonstrating that brood pheromones are releasers of pollen foragers. The addition of brood pheromone had no effect on the number of nectar foragers.
5. **False** Fluvalinate which is the active ingredient in Apistan Strips®, is a synthetic pyrethroid acaricide used throughout the world to control the *Varroa* mite. Initially, there was concern that honey could be contaminated with fluvalinate residues. Research has shown that fluvalinate breaks down fairly rapidly in honey through hydrolysis, however, fluvalinate accumulates in wax. Fluvalinate is much more soluble in wax than in honey; is very stable in wax and residue levels in wax increase by repeated exposure to fluvalinate treatments.
6. **False** Either the amount of queen substance produced during the swarming season or a reduction in its distribution are believed to be involved in the development of the swarming impulse. It has been shown that there are no differences in the production of queen substance between queens in colonies preparing to swarm and those not preparing to swarm, which suggests that it is transmission of queen pheromones which is reduced rather than the queen's pheromone output prior to queen rearing in preparation for swarming.
7. **True** From the Russian stock that was imported in 1997 by the USDA ARS Bee Laboratory in Baton Rouge, three lines of Russian queens have been selected for their desirable characteristics and released to the industry's queen breeders. Extensive testing has shown that pure Russian stock is resistant to both *Varroa* and tracheal mites with the likely possibility that chemical treatments will not be necessary. Hybrid Russians currently available are from pure Russian queens, which have been open-mated with non-Russian drones.
8. **False** SMR queens which have been selected for suppressed *Varroa* mite reproduction by Dr. John Harbo, USDA ARS Bee Laboratory, is a line of bees that have been bred from domestic stock, not Russian, which shows resistance to *Varroa* mites.
9. **True** Bees that are exposed to a crosswind on the way to a feeding site compensate for the drift by heading obliquely across the wind. Therefore they see a different solar angle than during direct flight in calm air. In spite of this the dances point straight toward the goal.
10. **False** During swarming preparations, the honey bee queen is placed on a strict diet and loses approximately 1/3 of her weight. Since the workers feed the queen less royal jelly during this period, egg laying declines and the queen's abdomen shrinks, enabling her to fly with the primary swarm when it leaves the hive.
11. **False** The time necessary for collecting either a load of nectar or pollen is highly variable. Pollen-collecting trips are usually completed much more quickly than nectar collecting trips.
12. B) Nurse Bees
13. A) Nassanoff Pheromone
    D) Queen Substance
14. B) is getting ready to issue a swarm.
15. Individual bees do not wander at random over a crop but usually return for several consecutive trips or days to the same localized foraging sites. These foraging areas may be a few square yards of a large field crop or one or two individual bushes or trees. Factors that affect the size of this foraging area include: distance between plants (plant density), number of flowers per plant, stage of flowering, amount of nectar and pollen available, weather conditions, and competition from other bees and pollinating insects.
16. The presence of white, freshly secreted wax along the lower edge of the comb's top bar is an indication that an additional super is needed.
17. Queen cells on the comb surface in a colony with a double brood chamber usually indicates that the colony is in the process of supersedure (replacing the old queen). No action should be taken.
18. Multiple eggs per cell in a colony that has adequate room in the brood nest for the queen to lay eggs, would indicate that the colony is probably hopelessly queenless and has laying workers. Destroying the colony would probably be the best approach, since it is almost impossible to

Continued on Next Page

introduce a new queen to a colony with laying workers.

19. *Sickle or Crescent Dance*
20. *The Sickle or Crescent dance is intermediate between the round and wag-tail dances. As the distance from the hive to the food source increases to a range of approximately 10 to 100 meters, the dance form changes into a crescent or sickle dance. Beyond 100 meters the sickle form changes to the well known wag-tail dance. The forager is informed that there is a nectar or pollen source within 100 meters of the hive. Go out and search for it. No information on distance or direction is given.*
21. *Diseased American foulbrood colonies are killed with either soapy water or the pesticide Resmethrin.*

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.

GLEANINGS

JUNE, 2002 • ALL THE NEWS THAT FITS

Visit Beautiful Lake Tahoe, CA

ATTEND WAS 2002

Make plans, now, to attend the upcoming Annual Conference of the Western Apicultural Society (WAS) being held from August 12th to 15th, 2002. The venue for this meeting is the Biltmore Hotel and Casino, in Crystal Bay, Nevada, on the North Shore of Lake Tahoe. The surrounding western mountains are spectacular. The Lake is beautiful, and we will be having our barbecue on its shore, right next to the outdoor Shakespeare Theater.

The lecture program is divided into four distinct sessions covering 1. Hive Products for Health, 2. Honey Bee Behavior, 3. Practical Beekeeping, and 4. Honey Bee Research. In addition to offerings from our "resident" experts like Mike Burgett, Steve Sheppard, Rob Page, Christine Peng and Eric Mussen, we will be treated to a presentation from Christopher Kim, MD, who is studying the effects of venom therapy on 400 patients in S. Korea. Louise Estupinian will be available to discuss the results with Pine Street Clinic patients who are on venom therapy, and Linda Edwards will discuss the necessity and use of the EpiPen autoinjector for anaphylactic shock reactions. To examine the tentative program, visit Eric Mussen's Web page at: http://entomology.ucdavis.edu/faculty/mussen/beebriefs/index.cfm.

Conference lodging is going to be tight. Every room in the vicinity will be sold out at that time in the summer. A block of rooms has been reserved at the Biltmore and it would be a good idea to reserve one, soon. The Biltmore will not charge you for the room in advance and they will release your reservation just a few days before the meeting, because they are sure that they can fill any empty rooms. To get our somewhat reduced room rates (that include breakfast), call the hotel before July 12th at 1-800-245-8667 and be sure to mention the Group Number 0812WAS when you book your room. To see the room prices (includes breakfast) *and other information on the conference, refer to the above Web site.*

Conference pre-registration is being handled by George Steffensen, WAS Treasurer. You can download a copy of the form from the above-mentioned Web site and send it to George at WAS, P.O. Box 956, Grants Pass, Oregon 97528. Pre-registration fees are $50 per person ($60 later). The barbecue at the Lake is $22 per person and the Awards Banquet is $30 per person. The rooms are handled individually, as is mentioned above, and so are most other lunches and dinners.

SEND US YOUR MEETING NOTICES TWO MONTHS IN ADVANCE

Good Bloom, Bad Weather

ALMOND CROP UPDATE

Following what some have called the best bloom conditions in memory, the weather experienced during the post-bloom period has posed serious difficulties for some areas of the state. As reported in the March issue of *UPDATE* (Blue Diamond Growers), the west side of the Sacramento Valley experienced very cold conditions on the morning of March 8 with the resultant loss of approximately 25 million pounds of crop. Many orchards were complete losses while many more were seriously damaged. Damage was wdespread, ranging from the Arbuckle area in Colusa County, north along the west side of the valley into the Artois area of Glenn County. The San Joaquin Valley generally escaped damage from frost, however, there are isolated reports of low lying orchards and those adjacent to open lands sustaining some degree of damage. Isolated thunderstorms dropped heavy amounts of hail in the area north of Manteca in San Joaquin County, causing severe damage to an area of orchards covering several hundred acres.

Across the state, growers are reporting strong nut sets on nearly all varieties, particularly Nonpareil. Greatest variability is found in the Carmel variety, which generally exhibited the poorest bloom overlap with the Nonpareil and has also been affected by an increasing amount of Non-Infectious Bud Failure.

For the latest update on conditions around the state, please check the Blue Diamond website at www.bluediamond.com

from the Update

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BOTTOM BOARD

Reporters, and The Truth . . .

Peter Sieling

My mother-in-law sent me an article from her local newspaper featuring a beekeeper. I've noticed that writers who cover beekeeping like to spice up the story for their readers by using mystical sounding words and phrases. For example, I don't just keep or raise bees, I "ply the ancient craft of keeping bees." I don't know the bee's mood by the weather, their behavior at their entrance, or the pheromone smell when I open the hive. I "tune into the consciousness of the hive." Writers sprinkle in a few phrases like the "rhythm of birth and renewal" and the "sacred geometry" of the honeycomb. "He gently wafts the smoldering herb-filled antique smoker over the combs like a priest with incense." Honey isn't sticky and sweet, its "golden heady fragrance" is the "ambrosia of the gods." Blah blah blah

I guess that's all right for general interest articles – good filler for newspapers. These stories may even sell honey, at least to people who are bored with canned pumpkin pie filling recipes. But I have a theory. If a beekeeper told a newspaper writer the unedited, uncensored truth about the behavior of honey bees it would be much more astonishing and interesting than the embellished prose.

We have a local reporter, who, like all newspaper writers, is constantly starving for stories. When our local library wants publicity, they send a fax to Rick Roberts:

Press Release – [Howard, NY] Howard Public Library buys new book

Twenty minutes later Rick Roberts arrives with a camera with a three foot long lens and tripod. A tape recorder swings on his hip, a pen and notebook in hand.

I could do the same thing:

Press Release – [Howard, NY] Howard Man gets Swarmed in Honey Bee Sting Operation

By the time I zipped up my bee suit, Rick would be pulling in the driveway talking on a cell phone, writing furiously in his notebook, and steering with his knees.

"Hi, Mr. Roberts. I was just lighting my "

"Heyyy, Mr. Sieling, what's your slant?"

"My what?"

"Your slant, you know – angle." He tapped his notebook impatiently with his pencil and fiddled with the camera lens cap.

"Oh yeah, I thought something like: with bee behavior, the truth is more fascinating than any mystical stuff you might read in the newspaper."

Rick brightened. "Hey, what's that can with the spout on it?" He snapped a couple pictures of me lighting it.

"That's the smoker. The amazing thing about bees is the complex communication that goes on in the stygian darkness of the hive. You can quote me with that word, "stygian" I got it from "Tarzan of the Apes" and always use it when I can. Honey bees use the sense of smell and with this smoker I confuse "

"Looks like one of them Greek Orthodox incense burners they wave as they walk down the aisle. I feel a slant coming on." Rick began writing furiously.

I led him up into the apiary. His camera clicked and hummed all the way. I decided to stun Rick with a fact I learned at a queen rearing course. "Did you know a virgin queen, if she escapes from her cage will find and enter a queenless colony? How does she know?"

"Mmm let's see eternal cycle of birth and ah . renewal . Say, can you hear me if I stand over here?" Rick backed a respectful 200 feet away. I gave him my veil and gloves. He cautiously returned.

"The guard bees guard the front door. So I sneak in through the roof. See how gentle they are with just a light puff of smoke."

Rick muttered as he wrote, "His hands move reverently over the hive as a healer feeling for dissonance in the aura of his patient, sensing their rhythm, err, well-being . Heck, I'll check the thesaurus later. How long have you plied this ancient art anyway?"

"Longer than you've been writing." I pulled out a comb. "I love this smell. I remember it from before I could talk. In the barn as a child I used to stick my nose into the empty honeycomb ..."

Its delicate ambrosial aroma drifts through the temple of the melliferous goddess of holy cow! Look at the honeycomb. How do they get it so even?"

"Well I'm not sure, although different races of bees will make slightly different sizes."

"The sacred hexagon, the universal unit of measurement, symbol of strength and coalescence of the seer's wisdom and the pragmatic knowledge of the engineer. Hey, this stuff will make great filler for the paper."

"His hoary face etched by years in the sun, his body stooped with slow deliberate movements. He recognizes his bees as he passes them busily gathering the ambrosial nectar and gives them a slight nod of greeting. One suspects they wordlessly wave an antenna back in respectful salute."

"Listen, thanks. This will be great. I'll fill in the holes later." Rick snapped shut the notebook. "I've got to get over to the Howard Public Library. Someone just donated a whole box of *Reader's Digest* Condensed Books."