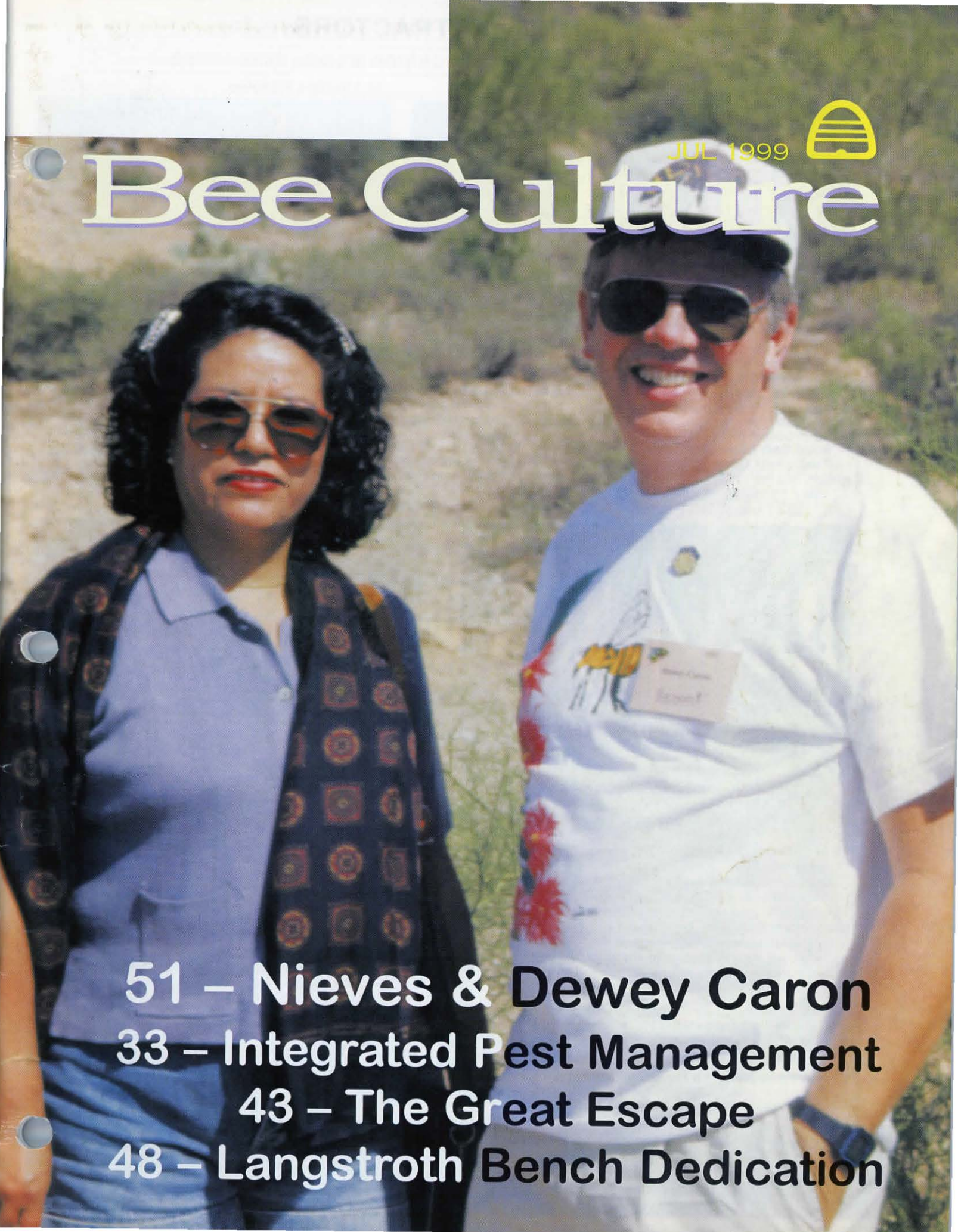

JUL 1999

Bee Culture

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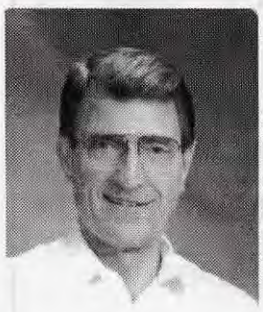
THE MAGAZINE OF AMERICAN BEEKEEPING

JULY 1999 VOLUME 127 NUMBER 7

FEATURES



JOHN ROOT
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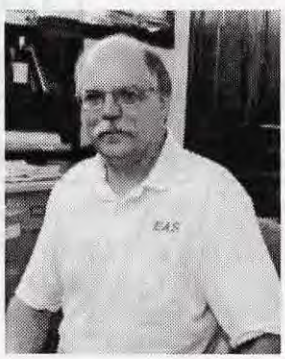
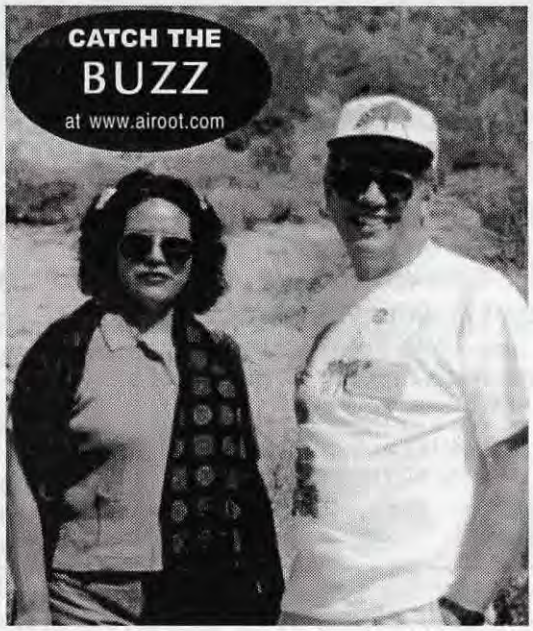


KIM FLOTTUM
Editor



COVER

Dewey and Nieves Caron. Dewey retires as EAS Chairman Of The Board this month. *See page 51.*

photo by Kim Flottum

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

Publisher ..... ***John Root***

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INNER COVER

One of the best ways to make your organization's newsletter better is to make your Editor's job easier. I'll bet every Editor, or anyone who has been an Editor knows what I mean. If you aren't responsible for your group's newsletter, but wonder why yours isn't what you think it should be, walk with me awhile and let's look at what your 'Editor' *is* responsible for.

Assuming your newsletter's primary function is to announce the next meeting, there is a mailing deadline that must be met. If all there is is the announcement, a postcard is all there is. More? Minutes from the last meeting? Something from the President? News from other members? A library list? Future meetings and speakers? Actual news? A financial report? More?

So. The Editor is supposed to track all those writers and articles down and make sure they get what's needed in, in time. And they all are, right? *Every* time? Really, now how many times a year does the Editor have to chase one, two, several people to get their part done, so the newsletter can get out, on time, every time? Once is excusable. More, not.

With luck the Editor has a computer and all these stories, articles and reports arrive on disk or via email so they don't have to be retyped. *With luck*, they're fairly well written and don't have to be rewritten. *With luck*, it's actually right and doesn't have to be fixed (dates, places, time, people).

If not or if it comes in hard copy (already typed (best) or handwritten) it has to be entered, into, what, some type of print/publishing program?

Then after all this chasing, there's the typing and the organizing, adding clip art and photos or cutting and pasting that needs to happen to make it work. That, of course is after proofreading and a couple of drafts to make sure everything fits, is corrected and is there.

Finally, the final draft. Then duplicated, (Where? Who actually makes the copies, drives to the printer, or does it at work, picks them up, pays the bills) and next folded (if the printer didn't), sealed (NOT stapled, or the Post Office will get even), labeled (where did the labels come from, by the way? And were they on time?) and, finally taken to the post office and mailed. On time, every time. Then, start all over again.

I think you see where I'm going here. The Editor ends up, in many cases, being the conscience of the group. Forcing Presidents and others to attend to *their* jobs so the newsletter can get done. Not every group has this situation, but far too many do. Being an Editor isn't just about editing. Rather it's babysitting, typing, computer operation, dealing with printers, the post office and record keeping. But most know this going in. Or thought they did.

Some Editors I know relish the variety, but many are appalled by the lack of cooperation they get from everybody. Perhaps that's why turn-over and burnout are so common.

How can an Editor's job be made easier? Assuming the Editor is stressed by all of this (and some aren't, by the way), but *even if they aren't*, they could do their job better if everyone else just did their job. Every one of the inputs mentioned (President, Secretary, Treasurer) comes from somebody who raised their hand and said "I can do that." That means more than showing up. It means communication, to all members, not just those who make the meetings (some can't, remember?).

A newsletter Editor I know put on a 'how-to' workshop at EAS last year and made a suggestion that was elegant in its simplicity. Have an 'Editor' and a 'Publisher.' The Publisher does the chasing (if needed, but it shouldn't be), and the printing, folding, labeling and mailing. The Editor, meanwhile, is actually creating the newsletter. And, of course, all the rest of the members are contributing in their routinely timely manner, right? This is a team effort. More than one make this happen.

Better newsletters are more than form, content and function. They start with an enthusiastic volunteer. But I can guarantee that if you dump on that energetic soul often enough your group will be Editorless, again. So lend a hand. Be on time (or early). Make an occasional contribution. If everyone does their part, at least most of the time, your newsletter, and your Editor will both live long and prosper.

•

Continued on Page 51

More On Newsletters; Chaos In The Beehive;

KEEP IN TOUCH

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

MAILBOX

Unhappy In Canada

I have been a subscriber to *Bee Culture* long before it acquired that name. Though I live in Canada I thought of *Bee Culture* as a broad-based journal on apiculture rather than a regional publication.

Unfortunately too much of your material suffers from regionalism.

For instance in the January 1999 issue there was a rather comprehensive and analytical summary of 1998 honey prices. Unfortunately it stops dead at the 49th parallel. I know bees can cross this line but your analysis cannot.

You must have many readers in Canada. The usefulness of *Bee Culture* would be greatly enhanced if its vision did not stop at the border.

Sincerely.

Andrew Dziadyk
Saskatoon, SK

The Whole Family

The birds and bees have done it again! The day before our second child was born, we were checking our hives. We consider our 25 hives a family business. Also in the photo is Holly (5).

Lloyd Elling & Robyn Quaintance
Sidney, BC

Peta Peepers

Keeping bees in Southeastern Virginia is a daunting task. We don't have the Winters of the North, nor the Summers of the South. What we do have is Norfolk, VA, which has the dubious honor of being the national headquarters for PETA. Therefore I was quick to notice on your April cover, which was very clever, included a couple of "PETA Peepers."

Although the clock on the wall gave the time as a quarter past seven, it was hard to determine by the sun, was that morning or evening? As a long time beekeeper, I know the bee business can deteriorate very quickly into what is shown on your cover scene from early morning and seemingly last until evening. With so much bee related activity going on, that would explain how those two "PETA peepers" were able to trespass undetected across the property, climb onto the roof, to peer upon this hapless business owner through the second story window.

I know how they feel, since I have had personal contact with "PETA peepers." While giving a demonstration of beekeeping at an Agriculture Day observance held in the atrium of our city's central library, I was approached by a couple who seemed genuinely concerned that the honey bees in my observation hive did not have any fresh flowers available on which to find food. I explained the honey in frames was available to them for their food. Seemingly satisfied, this couple was suddenly horrified when they noticed the queen had a spot of paint on her back! I was promptly subjected to about 20 minutes of lecturing delineating my obvious lack of conscious and loss of mental stability that I must have surely suffered in order to have introduced such a foreign substance into the hive on the back of my painted queen. They conjured up a picture of toxic fumes and polluted honey, everyone getting ill because of tainted products from my farm.

Trying to keep my composure, I was able to end this harangue only by pointing out that the paint on the queens was hardly any different than the colored polish she had on her own fingernails, and she had obviously survived that ordeal of painting quite well.

Art Halstead
Chesapeake, VA

Reducer - Best Thing

In reply to Chris Lumley in the May issue I find that the wooden reducer is the best thing to come down the pike! I've had bees for over 25 years with a yearly average of about 12 hives. I must say that I've had excellent results with that "typical small board stuck in the entrance." With an opening about six inches wide and only 3/8-inch high, I find that four or five strategically placed thumb tacks will discourage the mice. Hardware cloth allows too much of the Winter breeze to enter the hive. Remember, the bottom draft is only for wood burning stoves! Ventilation? Yes, of course. For that I use two small pins to hold up the front end of the outer cover.

Norman Shaw
Hyde Park, MA

Wants A Job

I am 48. I am engaged in beekeeping for 12 years. I've got the special education at the Orenburg State Agricultural Institute. I am looking for a place where I can use my skills. I'd like to be hired in a bee garden to do the duties of any kind. I'd like to meet people who like bees, who admire their hard working nature and are fond of dealing and working with them.

Vlad Bourloutsky
Komsomolskaya str., 85 ap. 166
Orenburg, Russia 460000

Continued on Next Page

MAILBOX

To Tom Sanford

I enjoyed reading the APIS newsletters and particularly the March, 1999 APIS article entitled "Supplemental Protein Feeding." I remember seeing a reference somewhere to the Beltsville Bee Diet which as I recall was a pollen substitute/supplement. I haven't been able to get a response from the good bee folks at Beltsville and wonder if you have a reference (online preferred) or the recipe for the Beltsville Bee Diet.

As I stated earlier I do enjoy the APIS newsletters but I have one suggestion (and feel free to correct me if I am wrong). If the current issue was always linked to the same URL it would be easy to use one of the various "notifier" services to let APIS readers know that a new issue is available. These services work by periodically checking an URL for changes and upon determining that a change has been made usually send an email to the subscriber. I haven't found a single URL for APIS that is always the current issue. The newsletters seem to be found only within the yearly summary pages. So might I suggest the creation of an URL that always points to the current issue?

Thank you very much for making APIS available to us on the WWW. I also follow your articles in *Bee Culture* and think it is great that you and the staff of *Bee Culture* are concerned with the "Digital Age."

Bill Daniels
Collierville, TN

Wants To Learn

I am a young adult interested in beekeeping, but am unable to find somewhere where I can take a course. I looked into Fairview College in Northern Alberta, Canada, but their course is no longer running.

I was wondering if you or any of your readers could help me out. I would be willing to go just about anywhere in North America.

I would love to have the opportunity to take a beekeeping course.

Keren McCaughtrie
Site 520 Box 51
Brandon, MB
R7A 5Y5
Canada

UK MEETING IN 2000

As specialist producers of Comb Honey here in Hay-on-Wye we read Lloyd Spear's articles on Comb Honey with particular interest.

Naturally things are very different in the United Kingdom. Our season is later and our major flows more limited with particular regional differences.

I look forward to hearing Lloyd Spear explaining his system when he attends our great 2000 Spring Convention, near Coventry, Warwickshire, April 15-16, 2000.

We are negotiating to include another top flight speaker from the U.S.

Professor Mark Winston has already described his experience at

MAILBOX

the convention in *Bee Culture* last year but the gathering for 2000 is planned to run over two days to mark the Millennium and will have an enhanced program.

Trade and educational exhibitors are already booking up from all over the UK and Ireland as well as Europe. So it should be a humdinger of a weekend.

As the event builds up over the next few months details will be available from British Beekeeper's Association Headquarters National Agricultural Centre, Stoneleigh park, Warwickshire, CV8 2LZ.

Betty & Karl Showler
Hay-on-Wye, UK

Queen In A Bag

I have experienced problems regarding shipments of queens from the state of Georgia. The bag that the queens came in was placed inside of a plastic bag and sealed. Of course the plastic bag was taken off before they brought the envelope of bees to the counter for me to pick up. The postal employee told me about the plastic bag.

Of course they were insured, but what good are dead bees.

I have since ordered queens from a different state and have had no problem. Are you aware of this? No doubt movies and distortion of the truth regarding killer bees may be what we are reaping by postal personnel panicking. In a phone call to the shippers in Georgia, they wee aware of the plastic bag problem. I don't know if this is only a problem in that state or if it is more widespread. It could be someone else in the postal department somewhere between our two states. Maybe you can shed more light on the problem.

Neil Taylor
Almont, MI

Old Friends

I started to keep bees around 1967, and had up to 50 hives during those 15 years of beekeeping. But when I moved to northern part of Quebec close to Labrador for my work, I had to leave my bees behind: the only flying insects over there are black flies and mosquitos . . .

I had subscribed to *Gleanings* right from the beginning, to my moving north. I preciously kept all those magazines, along with some of my beekeeping material, for future use. Well, the "future" was last year, and I am happily back to beekeeping with eight hives this year.

You sent me a sample of *Bee Culture* a couple of weeks ago. While the magazine has evolved during these years, you still have the same spirit and philosophy: simple articles, based on scientific studies as well as practical experience from beekeepers, with new ideas and subjects to write about, but without rejecting the past. And all that powdered with love of nature and some poetry I would say.

When I discovered Roger Morse and Richard Taylor were still writing in *Bee Culture*, it was like meeting old friends. Their pictures have changed, but I see the same in my mirror.

You will find herein my subscription form, together with a money order. I am sure I will keep on enjoying your fine magazine.

Denis Poudret
Saint-Georges, Quebec
Canada

THE WISE GUY

Have you ever known someone who ran for public office and won? Then two years later you wonder if he had a brain transplant after the election! Doesn't it seem that people with good ideas during the election process lose those ideas after the election? Don't you ask yourself how that person can do such a turn on the issues that seemed important during the campaign?

I do believe that when you create a bureaucracy, then have elected or appointed citizens to oversee the operation of it, you get the bureaucracy running the board. This is very accurate in the way the National Honey Board is run. You have the bureaucrats running the board! It also seems that the board members either lose their ability to think or choose not to question anything that comes from the bureaucratic side of the organization. My largest question is why didn't the board members start asking about the decrease in honey consumption? This is a serious problem in our industry. If it continues to decrease, where will we be in 10 more years?

I firmly believe some of these appointed board members enjoy the benefits of being a board member more than they understand what they are appointed to do. If each board member had to pay his own transportation and lodging costs to attend the Honey Board's meetings, would they always fly there, and would they stay in $150 per night hotels? The next time you go to a national meeting, poll all of the Honey Board members there and see if they drove there or flew there. When it's their money, the mode of transportation does change. I believe they should treat our money like it is their money.

I think I understand some of their lack of action or should I say the lack of questioning of the members coming from the Honey Board. There is a quiet intimidation factor that goes with the job. It is no secret that the bureaucrats of the Honey Board have a greater comfort with the honey packers, and since the Honey Board has packers on its board, they get to hear firsthand the discussions of the other board members. It is the producers' belief that if you speak against a packer or against some of their sponsored changes, you will pay.

One of the latest examples has been the quality assurance program battle. Some of the people who opposed this have been shut out from selling their honey by packers who have purchased their product for years. The producer was told in late Summer that his honey would be purchased, but when the battle over some program or another started, the packer would not return phone calls, and finally the producer was forced to sell at a much lower price.

"I firmly believe some of these appointed board members enjoy the benefits of being a board member more than they understand what they are appointed to do."

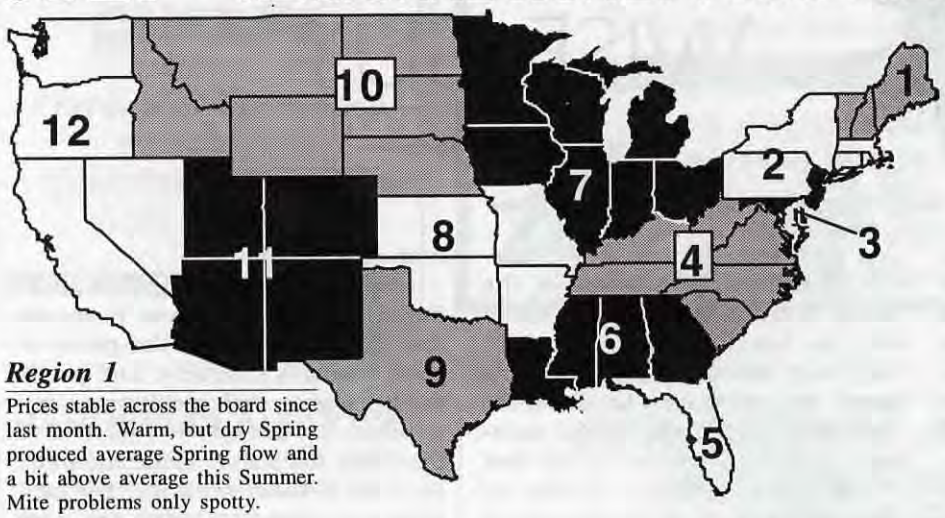
Should we allow packers and importers on that board? The answer is simple. We are the only ag commodity who does this, and it is foolish. Do you think the corn council would allow corn ag to help them establish the rules of their committee?

This whole business used to be relationships, and now we have changed it into an adversarial type business. Why would a packer ask me to sign a document saying I have not used any unapproved chemical in my hives when he imports 50 percent of his production from Argentina? Does he get a written statement from each of the beekeepers from Argentina?

We no longer trust them, and they no longer trust us. It seems that greed has taken the place of good business practices, and packers are using their position to intimidate producers. If this is not true, why don't they invite the public to all of their meetings? Do they have something to hide? Are they ashamed of what they talk about? Is there price fixing going on? Do they talk about certain beekeepers and how they won't do business with them? Are there illegal activities going on? Are inside deals made that affect honey producers? What do they have to hide? If these folks have nothing to hide, quiet the rumors, shut us all up, announce all of your meetings, make them public, let us attend, and publish an agenda to let us know what your concerns are. Producers have allowed the packers access to every meeting they have. If as a group the packers refuse to allow public access to their meetings, then we know something is wrong.

Back to our original thought: If you beekeepers on the Honey Board are in it for the frills, then get out! Be active, ask questions if you are intimidated by the bureaucrats and other members or get out! You are appointed to review the bureaucrats, and right now the majority of the beekeepers I speak to are not happy with the National Honey Board. I do believe that as a beekeeper, it is your responsibility to ask your locally or regionally appointed member how he or she plans to reverse the decline of consumption of honey. Ask your representative on the Honey Board your questions about what is going on in the honey industry today. These people represent you and your business. Tell them you expect some action other than comparing mileage data on their frequent flyer miles to Honey Board meetings. BC

JULY – REGIONAL HONEY PRICE REPORT



Region 1

Prices stable across the board since last month. Warm, but dry Spring produced average Spring flow and a bit above average this Summer. Mite problems only spotty.

Region 2

Prices down a point or two across the board. Cool Spring, dry weather reduced Spring flows and will keep Summer crops about average. Mites and weather biggest problems.

Region 3

Bulk prices up a bit, but stable otherwise. Average to good early Spring weather and mild Winter helped to produce good Spring crop and better early Summer flows.

Region 4

Bulk prices up just a bit, wholesale steady and retail up some. Average to warm temps and reduced rain produced only an average Spring crop with Summer flows average to down if dry prevails.

Region 5

Bulk and wholesale prices up but retail down. Average to high temperatures and dry weather have given mixed results for both Spring and Summer flows. Hard to predict. Fires haven't helped either.

Region 6

Bulk and wholesale prices up a bit but retail down. Average to warm temps and low, low rainfall have produced only average Spring crops and declining Summer flows. Mites, beetles and the weather all causing problems.

Region 7

Bulk prices up a fraction, wholesale down a little and retail moving up slightly. Very warm temps, average to high moisture have produced mixed results for a Spring crop, but promise a good Summer flow. Most aren't complaining about the weather as long as timely rains continue.

Region 8

Bulk prices up a tad, but wholesale and retail down. Cool temps and lots of moisture have helped for a good Spring flow, but Summer flows look weaker. Mites, queen problems and swarming cited as problems.

Region 9

Bulk unchanged (if you ignore the typo last month), wholesale up a tad and retail down a tad. Average to warm temps and slightly less moisture than usual have produced a pretty good Spring crop and promises only fair Summer flows as long as some rain comes. Mites a problem.

Region 10

Bulk prices down a little but wholesale and retail steady. Mixed weather across the region has produced, yes, mixed Spring crops. Most though seem to think an average or better Summer crop is in line. Queens cited very often as causing problems.

Region 11

Bulk prices steady, wholesale up and retail down. Producers predict average crops this season, but if the dry continues this will definitely change. On the edge for moisture and heat.

Region 12

Bulk and retail up, wholesale prices down. Southern areas dry, too dry and most have moved. The northern areas cold, wet and nasty, as far as Spring flow goes. Summer crop, unknown, but drier and warmer needed.

	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)	70.39	70.00	74.00	72.82	86.68	68.67	67.00	78.00	64.20	62.00	89.00	65.25	54.00-135.00	71.03	71.55	60.91
60# Amber (retail)	66.79	63.92	68.00	66.96	80.59	66.00	67.67	72.00	61.00	62.00	80.00	64.00	54.00-120.00	67.76	69.83	56.86
55 gal. Light	0.60	0.60	0.74	0.73	0.60	0.65	0.63	0.64	0.66	0.60	0.60	0.65	0.55-0.70	0.61	0.62	0.81
55 gal. Amber	0.59	0.55	0.65	0.66	0.50	0.61	0.59	0.60	0.59	0.55	0.56	0.60	0.47-0.68	0.57	0.60	0.77
Wholesale - Case Lots																
1/2# 24's	28.88	29.95	31.64	33.56	20.40	32.00	29.62	31.64	30.00	31.64	20.00	25.70	20.00-45.00	29.91	29.16	29.86
1# 24's	42.24	36.65	46.80	43.61	45.95	44.00	42.90	39.44	45.25	43.81	38.00	45.17	32.40-62.40	43.04	43.60	43.06
2# 12's	37.85	33.68	45.60	40.51	40.31	40.00	38.31	38.27	39.08	36.00	30.00	37.55	29.40-52.80	38.74	38.26	39.91
12 oz. Plas. 24's	35.83	33.70	43.20	36.37	37.66	38.50	35.50	34.27	37.28	38.40	36.00	35.99	26.40-50.00	36.57	35.86	35.15
5# 6's	40.73	37.48	54.00	49.00	42.50	44.00	39.35	40.50	42.50	37.50	37.50	37.08	31.50-54.00	41.99	41.15	41.08
Retail Honey Prices																
1/2#	1.84	1.65	2.83	2.17	1.15	1.75	1.76	1.76	2.50	1.59	3.00	1.62	1.10-3.69	1.86	1.86	1.90
12 oz. Plastic	2.27	2.14	2.50	2.28	1.69	2.10	2.01	2.12	3.25	2.37	3.20	2.06	1.39-6.00	2.26	2.24	2.26
1 lb. Glass	2.64	2.34	2.90	3.05	2.00	2.59	2.43	2.73	3.06	2.55	2.73	2.72	1.58-4.00	2.69	2.82	2.72
2 lb. Glass	4.45	4.30	4.80	5.30	3.79	4.24	4.21	4.38	4.71	4.02	4.80	4.29	3.45-6.00	4.55	4.56	4.54
3 lb. Glass	6.21	6.48	7.50	6.53	3.89	7.18	6.02	6.28	6.71	5.77	5.88	5.55	3.89-10.00	6.32	6.39	6.18
4 lb. Glass	7.33	6.85	8.07	8.03	8.07	7.50	8.10	8.07	7.25	8.07	8.07	6.00	6.00-10.50	7.72	7.95	7.30
5 lb. Glass	9.18	10.42	11.00	9.26	10.46	8.58	8.74	10.00	9.00	7.90	9.95	8.18	7.00-15.00	9.37	9.42	9.18
1# Cream	3.18	3.36	3.58	3.60	3.58	2.92	2.86	3.12	5.50	4.78	3.63	2.66	2.00-5.50	3.25	3.33	3.34
1# Comb	4.06	4.25	3.50	3.98	4.06	4.50	3.75	3.50	5.00	4.06	5.50	4.75	1.95-6.00	4.23	4.20	4.14
Round Plastic	3.65	3.15	3.50	4.00	3.92	4.00	3.22	3.66	5.50	3.92	3.50	4.00	2.00-6.00	3.76	3.85	3.66
Wax (Light)	1.34	1.30	3.00	1.85	1.00	1.50	2.22	2.15	1.67	1.40	2.50	1.94	1.00-3.00	1.68	2.49	2.59
Wax (Dark)	1.30	1.83	2.75	1.68	0.90	1.80	1.99	1.93	1.75	1.30	2.00	1.70	0.90-4.00	1.77	2.18	2.25
Poll. Fee/Col.	36.25	40.50	35.00	35.00	30.00	37.33	36.00	38.75	20.00	37.39	50.00	37.60	20.00-55.00	37.16	37.07	37.07

?DO YOU KNOW?

Unhealthy Conditions

Clarence Collison
Mississippi State University

Every time a beekeeper breaks down a honey bee colony, it is important that the brood area be checked for any symptoms that might be associated with an unhealthy condition. Being able to recognize the early symptoms of a serious brood disease and knowing what to do about it is an important aspect of successful colony management. Prior to the introduction of the parasitic mites, brood diseases were always considered to be more devastating than adult bee diseases. Now mites are one of the most serious problems the beekeeping industry has to deal with.

Please take a few minutes and answer the following questions to determine how well you know your bee diseases, pests and parasitic mites.

The first nine questions are true or 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.)

1. ___ *Varroa* mites in the United States came from South America.
2. ___ European foulbrood is most prevalent in the Spring of the year.
3. ___ American foulbrood spores germinate in the midgut approximately one day after ingestion by the larva.
4. ___ Healthy worker larvae are light tan in color.
5. ___ Brood odor is a dependable, effective method of distinguishing between American and European foulbrood.
6. ___ European foulbrood kills quicker than American foulbrood.
7. ___ European foulbrood spores remain viable in brood combs for many years.
8. ___ American foulbrood can affect worker, queen and drone brood.
9. ___ Currently there are no chemical compounds registered in North America for the control of chalkbrood disease.

Multiple Choice Questions (1 point each)

10. ___ Bee eaters and honeyguides are examples of _____ that feed on honey bees.
    A. Hornets
    B. Mammals
    C. Reptiles
    D. Birds
    E. Amphibians
11. ___ The presence of "pupal tongues" is a characteristic associated with _____.
    A. American foulbrood
    B. European foulbrood
    C. Chalkbrood
    D. Sacbrood
    E. Stonebrood
12. ___ The first report of chalkbrood in the United States was associated with _____ .
    A. Honey bees
    B. Bumble bees
    C. Leafcutter bees
    D. Carpenter bees
    E. Alkali bees
13. ___ Tracheal mites are believed to have entered the United States from _____ .
    A. New Zealand
    B. England
    C. Brazil
    D. Canada
    E. Mexico
14. ___ Nosema infection develops mainly within the:
    A. Rectum
    B. Epithelial cells that line the midgut
    C. Malpighian tubules
    D. Hypopharyngeal glands
    E. Hemolymph (blood)
15. ___ Larvae die while still in the coiled stage, appear to collapse, and seem to be twisted or melted in the bottom of the cell.
    A. Sacbrood
    B. European foulbrood
    C. Chalkbrood
    D. American foulbrood
    E. Stonebrood
16. Name two approved techniques for treating honey bee colonies with Terramycin (oxytetracycline). (2 points)
17. Please indicate how tracheal mites get into the respiratory system of adult honey bees. (1 point)
18. Requeening is often recommended for colonies that have European foulbrood and sacbrood. Explain why this is a useful approach. (2 points)
19. Purple brood is a malady of bees in the southeastern United States. What is the cause of this disorder? (1 point)
20. The *Varroa* mite and bee louse, *Braula coeca*, are somewhat similar in size and appearance. How could you easily distinguish between adults of the two species? (2 points)
21. Please indicate how you would tell the difference between male and female tracheal mites. (2 points)

ANSWERS ON PAGE 56

Roger Morse

Research Review

"How do scouts make the decision of which new home to choose?"

Under normal circumstances, colonies of honey bees that are left alone become congested in the Spring. Congestion is the cause of swarming, and thus healthy colonies will produce a swarm every year unless the beekeeper takes steps to prevent it. How to prevent swarming has been the subject of hundreds of studies and papers. Perhaps not surprisingly, however, many aspects of swarm biology remain unknown, especially as regards the selection, movement to and occupation of a new home.

The paper I review below asks how the scout bees that search for a new home make a decision as to which of several potential sites is selected. After all, these are obviously small-brained insects. To undertake these studies, artificial swarms were made from normal colonies as follows: First, the queens were caged. Second, about 4,000 worker bees from the same colony were marked with colored, numbered discs and paint. These discs are available from several European firms. There are five disc colors numbered from zero to 99, and these can be used to label up to 500 bees. These discs were originally designed to fit on the top of a queen's thorax and to thereby mark queens, but they work quite well to mark worker bees as well. A dab of paint on the top of the abdomen of a worker allows you to mark a second, third or more groups of 500 bees.

It was in this way that the bees in the swarms used in these studies were marked. After the bees were marked, a cage with a queen inside was tied to a stake and the marked workers were carefully placed on the ground beneath the queen. These workers soon crawled up the stake and clustered around their queen.

Results

The number of bees in these test swarms that were scouts and danced for a new home ranged between three and six percent. Thus, in these swarms home-seekers and decision-makers included only 50 to 100 bees. By using only a small number of bees as scouts, while the rest do nothing, a great deal of energy is saved.

The scouts search in all directions and at varying distances from the parent colony. In the beginning, these scouts may find as many as a dozen sites that one or more of them believes is suitable for a new home. Eventually, however, all of the scouts accept one site, and how this is done is the great question that is answered by this study. Within an hour of the time the final decision is made, there is frantic dancing on the surface of the swarm cluster and the swarm becomes airborne and moves to the new home. The final site need not be the first one that was found and danced about.

What has been found is that there is "friendly competition among the scout bees that identifies the best site." A logical question to ask at this point is: Why do the bees not become deadlocked in the decision-making process? The answer is that "the dances of individual bees tend to taper off and eventually cease, so that many dancers drop out." In other words, there is no one bee that dictates what happens nor is there any one bee that persists and dances without end to indicate that the site she selected is best. Some bees may stop dancing for the site they first found and switch their allegiance to another site. However, the number that do so is small and the chief means by which the decision is made is for those dancing for a non-chosen site to stop dancing. The authors state, "We hypothesize that scout bees are programmed to gradually quit their dance and that this reduces the possibility of the decision-making process coming to a standstill with groups of unyielding dancers deadlocked over two or more sites."

Why do bees stop dancing?

The dropout rate among the scouts in the three swarms studied was quite high. For example, in one swarm, fewer than half the bees that danced for a site on the first day did so on the second or third day. In this same swarm, only about a third of the bees relied more heavily on the cessation of dancing than it did on bees switching their dancing to another site.

This paper asks several questions about the decision-making process and drop-out rate. For example, is there a disappearance of dancing bees as a result of mortality among them, perhaps as a result of predation? After all, they fly over a wide range of territory and crawl in and out of a number of dark cavities that could be inhabited by predators. However, the authors of this paper found that this was not the case. The three swarms, examined after five days of searching, lost fewer than about eight percent of their scouts from unknown causes. Thus, mortality among scouts is not an important consideration in the home site decision-making process.

It is clear that the decision to stop dancing is not affected by the fact that a small number bees investigate sites other than the one they first found and found these lacking in quality. Rather, the dancing scouts appear to lose interest in the sites they found satisfactory, even the ultimately chosen site, but this allows flexibility in the final decision and avoids a deadlock. BC

References:

Seeley, T.D. & S.C. Buhman. *Group decision making in swarms of honey bees.* Behavioral Ecology & Sociobiology 45: 19-31. 1999.

Mark Winston

To Market, To Market

"Leabrook Farms covers all their bases by selling blended honeys in addition to the varietals, and making the blends sound as special as the single-source honeys."

There's no better way to get to know a country than by its markets. I recently had the privilege of traveling to Adelaide, Australia, to attend an international conference on social insects, and managed to sneak off for an afternoon to experience the Central Market. It had the usual vibrant atmosphere, cacophonous noise, elbow-flying crowds and intense odors that distinguish any market around the world from the sterile, fluorescent supermarket atmosphere where we too often shop in North America. This market was, however, clearly Australian. In between the expected cheese, vegetable and fruit stands were stores like Coco's Tropical Fruits with an array of exotic down-under fruit, The Water Shop that sold 16 kinds of mineral, herbal and sparkling waters (and provided an opportunity to taste each one like a fine wine), and of course the inevitable kangaroo store: Kangaroo Gourmet Meats, displaying carcasses of bloody kangaroo meat that only a real "roo" connoisseur could appreciate.

It also had a honey store, but one that was much more than just a "bring your own bucket" outlet for bulk honey. The store is called The Honey Shoppe and Soapbox, and while it does focus on bee products, it sells an eclectic mix of Australian stuff, ranging from soaps to teas, emergency candles to aromatherapy equipment, range-grown eggs to a guide that identifies poisonous Australian snakes, and much more. While its core products are honeys and pollens from around Australia, the extent and diversity of other products that appear unconnected to each other make this store . . . confusing.

But it's not. As I roamed through looking at this bizarre blend of products, I began to understand the rationale behind The Honey Shoppe's strange mix of goods. In a subtle way, the store links the central theme of honey and bees with other products, providing an insight into why bee-related goods are so compelling to consumers, historically and today.

Take soaps, for example. Although bee products and body soap are rarely found in the same rooms in our homes as separate commodities, they often are combined as honey-scented or pollen-laden soap. Few of us would choose to bathe with pure honey or scrub our bodies with pollen, yet combinations of soap with honey or pollen are immensely popular in stores that specialize in skin and body care. Some of this connection is a real one. Honey, after all, does have considerable antibiotic properties, and the association of honey with healing goes back far into the annals of folkloric medicine. Even so, honey and especially pollen have no "detergent" properties, and even the most fanatic beekeepers would not claim that smearing yourself with sticky honey or rubbing your body with coarse pollen would do much to remove dirt. Yet, it is the image of honey as a pure product, and of bees as meticulous nest cleaners, that provides a link between bees and soaps. The array of soapy bee products in The Honey Shoppe and other stores around the world is eloquent testimony to the global and deeply rooted connection between bees and cleanliness.

Another link that might appear confusing to North Americans but makes sense in Australia is that between bees and products for survival in the bush, such as emergency candles and guides to poisonous snakes. Australian beekeepers have a cowboylike image in Australia, although with long-haul flatbed trucks rather than horses for steeds. They are indeed road cowboys, spending most of their time driving across the immense wilderness of the Australian outback to catch a eucalyptus flow rumored to be producing copious amounts of nectar hundreds of miles down some dirt-track road. They live out of their trucks, camping in the beeyard for weeks at a time, eating canned beans and whatever kangaroo meat they can hunt on the side, and extracting honey right in the yard before they pick up their bees and move cross-country to the next flow. It's no wonder that The Honey Shoppe sells survival gear in with the honey. Bush skills are part and parcel of the mythical legend defining the Australian image and reality of beekeeping in the outback.

Both The Honey Shoppe and Australian beekeepers who sell their own honey have gone to great lengths to establish a sense of place and variety for their honeys, linking honey with the natural world that is so prominent in the Australian

Continued on Next Page

"What is apparent from their marketing approach is the connection between the intense Australian relationship to their natural heritage and the plants that thrive and produce honey around the country."

psyche. I picked up a brochure from a company called Leabrook Farms while at The Honey Shoppe, and was immediately taken with the flowing prose they used to link honey with nature and place. Witness some of their writing:

"Whilst the bee adds its own secret ingredient, it is the plant which imposes its character on the resultant honey in terms of flavour . . . In Australia, honey has traditionally been marketed as simply 'pure honey' without attempting to specify any floral source. Such honey is usually a blend comprising lighter-coloured, eucalypt honeys, of which Australia produces some 500 species . . . In recent years there has been a renewed interest in varietal honeys such as Blue Gum, from the forests and flat, hilly areas in South Australia and Victoria; River Red Gum that grows along the banks of rivers, waterways and tributaries; Yellow Box, which grows mainly in the slopes and tablelands of New South Wales, Victoria and Queensland; and Leatherwood, unique to Tasmania, and growing in the West Coast forests, an area renowned for its rugged landscape and high rainfall."

What is apparent from their marketing approach is the connection between the intense Australian relationship to their natural heritage and the plants that thrive and produce honey around the country. This may be a difficult concept for Americans to grasp, but Australians have the same gut patriotic response to their outback that we have to, say, the American flag or watching the president board Air Force One. And, clever beekeepers and shop owners exploit that heartfelt connection to the land by promoting a link between varietal honeys and a location that resonates for anyone who has lived in or visited that part of Australia.

Leabrook Farms covers all their bases by selling blended honeys in addition to the varietals, and making the blends sound as special as the single-source honeys. Leabrook is associated with Coopers Brewery, an old and acclaimed South Australian beer and ale producer, and they exploit that connection well in their advertising. They proudly announce that their master blender, Trevor Lehmann, *"hovers over his honey like a doting parent, in the cool cellars of Coopers. Carefully filtering. Gently blending. To produce six of the best honeys in Australia, drawn from a range of secluded locations only he and his beekeepers know about."* Linking honey with seclusion and beer pushes two Australian hot buttons, and makes the blends sound appealing, just as the connection between varietal honey and the bush region they come from makes those honeys attractive to consumers, albeit in a different way.

Another link that was apparent in The Honey Shoppe was a connection between bee products and mood. The store had a large section dedicated to aromatherapy, replete with scented perfumes to relax even the hardest-driving Type A personality, and shelved with other healthful products such as anti-stress bath crystals, anti-stress teas, anti-stress massage oils with names like "Tranquility," "Vitality" and "Sensuality," and for some reason, range-grown eggs (I guess the chickens were raised in reduced-stress environments). A customer might come in for honey, but was certain to leave much calmer than when he or she entered.

A final link that jumped out at me in The Honey Shoppe was that between honey and other foods. The shoppe sells products such as almond oil, connected to honey via bee pollination of almond flowers, and macadamia nuts in honey, again with the pollination connection. They also sell other products in honey, such as ginger, which may not be bee-pollinated but just tastes good when the pungent, zesty sensation of ginger is cut with the smooth, sweet flavor of honey.

I left The Honey Shoppe feeling connected, enjoying the links between honey and an array of other products and issues. I felt grounded in the Australian bush, protected from snakes, relaxed from absorbing the anti-stressors, and especially hungry from all the connecting I'd done in the store. Next stop was the Charlesworth Nut House; try their warm roasted cashews if you want an experience even better than . . . warm honey. If you go, the Central Market is right off Victoria Square in Adelaide. Tell them the zoned-out professor from Canada sent you. BC

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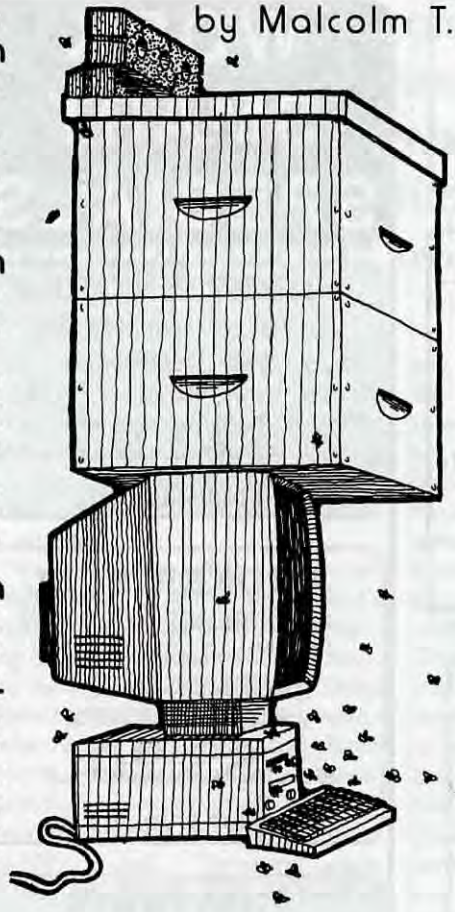
Beekeeping In The Digital Age

by Malcolm T. Sanford



http://bee.airoot.com/beeculture/digital

Electronic Monitoring and the Virtual Bee Hive

The digital commuter allows manipulation of numbers in ways humans could not imagine before it was perfected. Perhaps most celebrated is the Mandelbrot set, an equation incorporating slight changes, which when repeated millions of times, results in a graphic of seemingly wondrous order. A plot of this is often visualized in a form that is called a "fractal." We now recognize that many natural shapes from marine coastlines to the distinctive ginger root are fractals. Thus, from studying the Mandebrot set, new insight into how nature organizes itself emerges. Related to this is "chaos theory," or the study of "chaotic" processes, which often generate fractal shapes, or will yield a fractal image if a certain attribute is plotted on a graph. Chaotic processes usually involve some sort of dynamic process (things changing over time) following seemingly simple rules, usually with no random element, but nevertheless showing a seemingly "random" behavior.

Continued study of chaotic processes is yielding novel information on many natural phenomena. Consider the honey bee colony. I have often marveled at how the seemingly random behavior of thousands of insects in a colony results in extreme order. Perhaps the best example of this is comb made up of six-sided, thin walled cells for both storage of nectar and brood. Not only is comb beautifully constructed, but it is known that the hexagon shape is mathematically the best to ensure maximum strength using a minimum of material!

We are a long way, of course, from analyzing all the honey bee's processes using fractals and/or chaos theory. However, the digital computer is being employed to look at colonies in much more detail than previously possible. This is the focus of a project at the University of Montana called "Bee Alert. "The URL is http://biology.dbs.umt.edu/bees/default.htm. At that University, Dr. Jerry Bromenshenk has assembled an impressive team of persons. They include an analytical chemist, quantitative ecologist, insect pathologist, ecosystem modeler, computer specialist, and others. The focus is environmental monitoring using honey bees. According to the site: "Miners once carried canaries to warn of toxic gases. Bees and portable computers can now be used to assess environmental hazards through the development of electronic hives, toxicological models, extensive databases, and pattern-recognizing software that help assess risks posed by metals, radiation, carcinogenic chemicals, and pesticides. The goal is the early identification of environmental threats so corrective action can take place before further harm occurs. The challenge is to identify cause and effect for contaminant exposure while recognizing the influence of other variables such as mites, bee diseases, and management practices. Real-time monitoring of colony activities and conditions is an integral part of this effort." The sponsors of this project are a Who's Who of institutions involved in environmental monitoring and remediation. They include the U.S. Army Biomedical Research and Development Laboratory, Fort Detrick, MD, U. S. Environmental Protection Agency, National Health and Ecological Effects Research Laboratory, Western Effects Division, Corvallis, OR., U.S. Environmental Protection Agency, Office of Exploratory Research, Washington, D.C., and the Environmental Science and Research Laboratory, Idaho Falls, ID.

Measuring and monitoring colony activity at Bee Alert is accomplished by counting bee activity in electronic observation hives on the Montana campus and elsewhere. Each two-story single-frame hive has an array of electronic and chemical probes. Bidirectional entrance counters monitor the coming and going of every bee. Fourteen portals open into the hive. Each portal is fitted with an infra-red emitter and two detectors. The entrance structure is designed to assure that virtually every bee passes through a counter in an upright position. Other features include: pressure transducers to track changes in hive weight; traps that empty into clock-driven trays document the pollen gathering activities of the bees; sensors that follow the ability of the bees to stabilize temperature and humidity conditions in the brood nest; and air flow indicators (hot wire anemometers), which measure fanning activity used to cool the hive, drive off excess moisture from newly harvested nectar, and possibly remove volatile contaminants.

The Montana campus is equipped with unique indoor and outdoor facilities for assessing the cumula-

tive effects of human and natural stressors on honey bee colonies. The apiary is fenced and colonies have stands to keep skunks and other small predators at bay. A heated 8x16 ft. shed keeps nucleus (small) colonies alive and available for testing throughout cold Montana winters. There are 15 fully equipped electronic hives that track every bee flying in or out of the colonies. Electronic sensors continuously monitor conditions inside each hive as well as changes in the weight of the entire unit. Banks of portable computers inside metal tool boxes log colony performance and hive data. Electronic weather stations continuously monitor meteorological conditions. Artificial neural network software, a form of pattern recognizing artificial intelligence, helps us correlate bee activities with food availability and weather conditions.

The result of all the above measurements is an enormous amount of data collected each day. This information is provided on the Bee Alert Web site in both ASCII and JAVA format. The former is simply a listing of the incoming and outgoing bees over the course of a day; the latter shows graphs of this activity. A refinement of this is use of the bee cam (camera), which shows bees in translucent tunnels. Weather data is also provided by the Web site.

All the above information is available for analysis in simulation population models. One developed by the Bee Alert team is PCBEEPOP. This program provides daily estimates of colony size and age composition, as well as the amounts of pollen and nectar gathered, consumed, and stored by the colony. PC BEEPOP combines a simulation model, expert system, chemical toxicity database, and a tracheal mite module. In conjunction with TMITE, this model provides a flexible and powerful tool capable of examining the complex interactions of mites and bees. Anyone interested in helping further refine these models using a PC with at least a 486 or Pentium processor is asked to contact Dr. Bromenshenk.

The next step in the evolution of the Bee Alert project will be to install an array of these special observation hives around the nation. Dr. Bromenshenk is actively searching for support through museums and other institutions interested in hosting electronic hives. The information subsequently collected might become the basis of a collective "virtual beehive," something that beekeepers everywhere might access in the future as a reference for their bee management activities. BC

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All About Pollinating
PUMPKINS & SQUASH

Richard Fell

Interest in the production of pumpkins and squash has increased in recent years, as has the number of requests for information on the pollination of these plants. The primary interest of producers appears to be in the production of pumpkins and ornamental gourds for the Halloween market, with a lesser interest in squashes for the fresh produce market. Many of those involved produce these crops as a sideline, plant relatively small acreages of pumpkins or squash, and are concerned with quality and maximizing production. Most of the growers with whom I have talked also recognize the importance of bees and pollination. Some have expressed concerns about low bee numbers in their fields and have asked how they can tell if they have sufficient bees to obtain a good set. Surprisingly, good answers to these questions are not readily available. McGregor, in his book *Insect Pollination of Cultivated Crop Plants*, stated that little concrete data were available on the pollination of crops in the genus *Cucurbita*, and most references generalized about the need for and use of bees. Recommendations for honey bees varied from one to two colonies per 25 acres to one colony per acre. Not much has changed since the publication of McGregor's book in 1976, and little if any new data have been added to our knowledge on the pollination of these cucurbits. With this fact in mind, we began a study last Summer of pumpkin pollination and the role that honey bees play.

Pumpkins and squash produce large, showy flowers. They are usually orange or yellow-orange in color and are open for only a single day. The plants produce separate male and female blossoms, with male blossoms more numerous than female blossoms. The male or staminate flowers are produced at the end of thin stalks that grow in an upright fashion. The anthers and filaments are typically fused to produce a cone-shaped structure at the base of the flower. The nectary is located beneath the fused filament ring and is often inaccessible to foraging bees, although in some flowers, the filaments are not completely closed. Pumpkins and squash produce abundant quantities of pollen which tends to be large in size and not particularly attractive to honey bees.

Female blossoms are produced on a short, thick stem with an enlarged ovary immediately beneath the flower). The lobed stigma (female structure receptive to pollen) arises in the center of the flower, off a short, thick style. The nectary surrounds the stigma and provides easy access to foraging bees. The large exposed surfaces of the stigma and the open nectary provide a ready environment for bees to transfer the pollen necessary for fertilization.

The separation of the sexes in different flowers means that a method of pollen transport from male to female flowers is essential. Insects are the most obvious vectors, and several species of bees have been recognized as important pollinators of pumpkins. Bumble bees readily visit cucurbit flowers and can be very effective pollinators. Solitary bees may also play a role in pumpkin and squash pollination. The wild bees *Peponapis* and *Xenoglossa* have been identified as common visitors of pumpkins and squash in many areas of the country, but little work has been done on their value as pollinators, especially with regard to commercial production. Large numbers of these bees have been reported in fields in some areas of the country, but they do not seem to be very common in Virginia, at least in the fields in which we have worked. The bee most commonly observed was the honey bee.

Our studies on pumpkin pollination were made in a five-acre field planted with a number of pumpkin varieties, as well as several varieties of gourds and Winter squash. The major pumpkin variety was Howden. The primary goal of our initial studies was to gain a better understanding of bee visitation patterns, the relative attractiveness of

Female (left) and male (right) flowers of the pumpkin plant.

Continued on Next Page

Close-up, sectional view of the male or staminate pumpkin flower. The cone shaped structure in the center is formed from the anthers which produce the pollen. The filaments supporting the anther cone are fused to form a ring of tissue which normally covers the nectary located in the cavity at the base of the flower. Pollen produced by the anthers can be seen on the side of the flower.

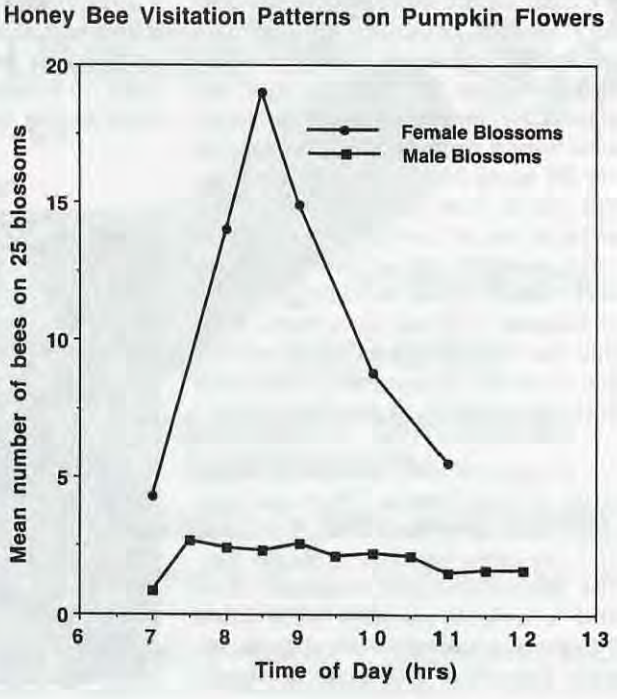
A normal male blossom (on the left) and two blossoms in which the filament ring covering the nectary is not completely fused. Male flowers with access to the nectary are particularly attractive to foraging bees.

the flowers, and, if possible, an idea of the role that honey bees might play in pollination. The studies were conducted the third week of July 1998, with follow-up visits to the field in late August and September.

As a first step to understanding the foraging behavior of honey bees on pumpkin blossoms, we made counts of the numbers of bees on flowers at different times of the day over a three-day period. Published reports of visitation patterns all indicate that flowers open early and close around noon. We began our observations at 7 a.m. and continued them until noon. Counts were made every 30 minutes on male blossoms with three observers each counting the number of bees on two sets of 25 flowers (total 150 blossoms). The number of bees on female blossoms was counted each hour, using four sets of 25 blossoms for each count. Observations were also made on the behavior of foraging bees with regard to nectar and pollen collection.

Nectar samples were collected in the field from flowers and from foraging bees for determinations of nectar concentration and composition. The sugar concentrations of nectar samples were determined with a handheld refractometer immediately after collection. Nectar was collected directly from male blossoms by opening the base of the flower and shaking a drop of nectar onto the refractometer stage (3x, 10 per replicate). Nectar from female blossoms was collected from foraging bees by catching a bee on a flower and then gently squeezing her abdomen to cause her to regurgitate a drop of nectar (2x, 5 or 10 per replicate). One-microliter nectar samples were also collected from individual flowers for the determination of sugar composition. Samples were collected in microcap tubes from flowers and placed in small vials containing 1.0 ml of 70% ethanol. The samples were placed in a cooler and later analyzed for sugar composition by high-performance, thin-layer chromatography.

Finally, 20 newly opened female blossoms were tagged on each of two different days to determine what level of fruit set was obtained with the forager populations that we ob-



Honey bee visitation patterns on pumpkin flowers. Counts were made over a 3-day period. The numbers of foraging bees on 25 female blossoms peaked at about 8:30 a.m. Male blossoms were less attractive and the numbers of foraging bees average only 2-3 bees at any time during the morning.

served in the field. The stems were marked with a piece of flagging tape tied immediately below the ovary. Several of the resulting pumpkins were collected at the end of the season, opened, and the seeds were counted.

The foraging activity pattern of honey bees on pumpkins and squash flowers is shown in the chart. Temperatures were warm during the three days counts were made, starting at around 75°F and rising to approximately 85°F by midday. Bee activity began early, and foragers were observed on flowers when counts were started. The number of honey bees on female flowers peaked at approximately 8:30 a.m., with a mean (average) of 19 bees per 25 blossoms. The numbers of foraging bees decreased rapidly from 9 a.m. until noon, when the flowers had closed and no activity was observed. The foraging activity of bees on male blossoms offered an interesting contrast, both in terms of the numbers of bees and the lack of any discernable peak in activity. The numbers remained relatively constant during the morning hours, varying between approximately one and three bees per 25 blossoms.

The behavior of bees foraging on blossoms indicated a primary interest in nectar collection. On pistillate flowers, the bees moved directly to the base of the corolla where the nectary is located, often standing on the stigma in a head-down position to collect nectar. The exposed nectary makes the female flowers very attractive, and as many as four or five workers were sometimes observed in a single blossom. The structure of the male flower makes nectar more difficult to collect, due to the closed ring of tissue which usually covers the nectary. The lack of available nectar makes male flowers less attractive, although gaps in the basal filament ring of some flowers makes them attractive. Bees which locate such blossoms can find a rich supply of nectar. In fact, male blossoms with a protected nectary often contain a drop of nectar sufficiently large for one to taste what his or her bees are collecting.

The nectar produced by pumpkin and squash flowers is highly attractive to bees in terms of both the sugars present and the concentrations. The major sugar in pumpkin blossom nectar was sucrose, although traces of glucose and fructose were present as well. Average nectar concentrations ranged from 39.6% ± 4.2% to 52.6% ± 3.2%. Male blossoms had the highest sugar concentrations; the 52.6% value was measured one morning at 8:30 a.m. with a similar high value (49.4% ± 3.0%) measured at 10:30 a.m. the following day.

Female blossom sectioned longitudinally to show the reproductive structures. The large ovary sits beneath the flower. The stigma, which is the portion of the female flower receptive to pollen, is a lobed shaped structure in the center of the blossom. The nectary is located at the base of the flower and is formed by a ring of tissue that surrounds the short stalk-like style that supports the stigma.

Foragers visiting male flowers also encounter large amounts of pollen. Bees often became coated with pollen, but usually flew to nearby leaves and cleaned themselves. In all of our observations, only one honey bee was observed scrabbling over the anther of a staminate flower in an apparent attempt to collect pollen. The lack of interest in pollen collection is further emphasized by the fact that we never saw any bees with pumpkin pollen in their pollen baskets.

Lack of pollen collection does not mean honey bees are not effective pollinators. The quality of the nectar and ease of collection provides a ready stimulus for honey bees to visit the flowers, especially the female blossoms. The attractiveness of the flowers also means that relatively large numbers of honey bees visited the field, given the number of open blossoms. High numbers of bees and repeated blossom visits contribute to good set. Our measurements of fruit set support the value of honey bees as pumpkin pollinators. Thirty six of the 40 blossoms tagged for an estimate of set were recovered, and 80.6% (29) of those blossoms set fruit. Seed counts from five pumpkins indicated good seed set as well; the mean seed number was 549.8 ± 102.1.

Using these figures to make recommendations for pollination is a little more difficult, especially since we have only a single year's data. However, we can suggest that growers who want to evaluate the pollination potential in their fields, make counts of the number of bees visiting 25 female blossoms. The counts should be made on a warm, sunny morning at about 8:30 a.m. At least three counts in different areas of the field should be made. If an average of 10-15 bees per 25 female blossoms is observed, there are probably sufficient bee numbers for good pollination. Lower numbers would suggest a need for more bees. The easiest solution to low bee numbers would be to bring in . . . more bees.

Given our current understanding of bee visitation and flower attractiveness, one strong hive is probably sufficient for the pollination of three to five acres of pumpkins or squash. Further studies are needed, but there is little doubt that honey bees can play an important role in the pollination of commercially produced pumpkins and squash. BC

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Kim Flottum

When the clock turns at midnight this New Year's Eve computers stop their computations based on the year 99, and have to start figuring things out based on 2000. Most will, some won't. The Y2K hoopla has focused on those that won't.

Beekeeping, packing honey, driving trucks, scheduling deliveries, record keeping on home or business PCs, the car you drive, your bank, your post office, your electricity and gas supplier, your web page, your tombstone, and a hundred, maybe a thousand other things in your life are run by, assisted by or influenced by computers. Then, consider for a moment that everyone you deal with suffers the same dependence on these zero-and-one producers that you do. So, even if you are prepared, and problems arise will those you depend on be ready? Cascade effect, regional problems, neighborhoods here and there in trouble . . . all are according to some, possible. Or not. Or just a little. Or maybe even worse. Statewide blackouts, food shortages, airplanes unable to land, major communications breakdowns, businesses shut down . . . or not. Or maybe.

I've collected a vast array of facts, opinions, guesses and what-ifs from a multitude of 'experts' in a variety of fields. Some of those directly affect our day-to-day lives, others are, or at least were relatively obscure, even invisible in our lives . . . until now. What follows are some shorts from some of these. Relax, it could probably be worse.

- Not only do the last two digits change, but in 2000, February 28 goes to February 29, not March 1. (Century Rule is that there are not leap years in years ending in 00, except when the century is evenly divisible by 400). *Who thinks these rules up, anyway?*
- U.S. food distributor survey early this year about 2000 readiness: 19% – very confident, 41% – confident, 28% – somewhat confident, 3% – not confident.
- Rural utilities as of January 6: 80% of electric co-ops and 88% of telecommunications indicate full compliance, or plans for full compliance by January 1.
- Some countries the U.S. imports food from will not be compliant. Fresh fruits and vegetables will be available – at higher cost *of course.*
- USDA surveys indicate most processes involving getting milk from farm to processor will have no interruptions – as long as electricity is available. *See above.*
- December 1998: USDA payroll, approximately 435,000 federal employees (20% of the federal civilian work force) is compliant. *First things first.*
- Fleming Companies (food distributor) predicts systems will be working, but with glitches – wrong dates and electronic transactions in some cases.
- The Small Business Administration has Y2K Action Loans available to purchase or repair software, buy new systems, pay consultants, provide relief from Y2K disasters to businesses. *Need money? Check this out. Usually no collateral needed.*
- From the Senate's Executive Summary of the Year 2000 problem: "The biggest Y2K impact may occur internationally. While the U.S. should have started earlier, worldwide preparations generally lag even further behind."
- FIX-Y2K, an infomercial from Singapore, is designed to raise awareness of Y2K and home computers – and sells software to fix it.
- From Compaq Computer Co: In a typical business, each computer user has created between one and 10 desktop applications. It will cost between $160 and $700/user to fix these. Imagine: The Commonwealth of Pennsylvania has 40,000 desktop computers – 9000 were noncompliant. *Now imagine the cost.*
- If your computer is older than 1990, you'll probably need both hardware and software update. *See loans, above.*
- A Harris poll in March indicates 40% of respondents will stockpile food, 28% will stockpile cash, but 32% aren't worried.
- Dr. Kevin Grold, a therapist from Del Mar, CA, has organized Y2K Anxiety Day on December 1, for computer specialists. *Does Hallmark have a card for this?*
- The Securities Industry in recent tests only failed .02% of Y2K test transactions. It cost $5 billion to fix it. *Guess who pays?*
- Coca Cola has spent $130-160 million to fix its Y2K problems

What Is Y2K Compliance?

The Federal Government defines Y2K Compliance in 5 parts, paraphrased here:

- Information technology accurately processes date/time data from, into and between the 20th and 21st century, and the years 1999 and 2000.
- Correctly processes dates before, at, and after 01-01-00, and processes 2000-01-01 itself.
- Recognize the year 2000 as a leap year.
- Accept, display, receive, print and store dates unambiguously.
- Correctly process logic dates that are used for non-date functions – i.e. information archiving functions, name conventions and passwords.

worldwide, but has contingency plans in place when/if suppliers have problems. *Coke is it!*

- TEOTWAWKI – The end of the world as we know it – won't occur because of Y2K, according to a U.S. Senate report. But there will be bumps in the road.
- On August 22, 1999, the computers on the Global Positioning Satellites expire. *Y2K early, if your car depends on these!*
- A January Gallop poll indicated 16% of respondents will draw out all their money, 26% will stockpile food, 17% will buy a generator. (*What do you suppose a hardly-used generator will sell for in February next year?*) Meanwhile, a third of small businesses have done nothing and 5% weren't even aware a problem existed. *Maybe they'll sell those generators.*
- And, a DataCorp Co. Survey found that 12,000 companies worldwide had spent only 2.6% of their IT budgets on Y2K fixes. That comes to $122 billion however.

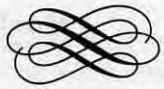
There are a million more of these tidbits that more or less debate the severity of this issue. More next time, plus some of the basics on what to do, and how to do it. Y2K will come. Know your neighbors. BC

CLUB CORNER

by Winthrop E. Baum

Getting Members

A series of articles designed to provide ideas, guidance and a road map for regional beekeeping clubs. Prepared by members of The Back Yard Beekeepers Association (BYBA). Founded in 1993, the BYBA's membership consists of 150 hobbyist beekeepers from Fairfield and Litchfield Counties (Connecticut) and Westchester County (New York). www.fairfieldweb.com/byba



I've just come back from a delightful affair! I had 24 of the cutest little faces watch me as I described the joys of beekeeping to these children and their parents at one of our local nursery schools. The kids were great. The parents asked interesting questions. And my props (discarded pieces of rogue comb) all combined to make a great "Show-and-Tell" event! The occasion gave me the opportunity to present the myriad of benefits and numerous joys beekeeping offers, and tell it to an audience who was prime to have a potential change of mind. What better way to explain to families these many benefits, than with and through their children?

Growing membership in any organization is vital; for a beekeeping club it is just as essential. The level of popular interest in beekeeping is such that today's beekeeper is quite a novelty in any community. Your efforts at public awareness can greatly change not only the number of folks interested in bees and beekeeping, but also redirect their attention from the negative aspects of bees to the overwhelming positives that we, as established beekeepers, know very well. A stagnating membership harms a club's ability to revitalize itself; it is the new members who often inject the organization with the requisite enthusiasm, propelling that organization forward, and keeping the entrenched members from going stale themselves!

Did you know that most of the population has the wrong idea about the honey bee? That a lot of parents teach their children to avoid contact with all kinds of insects, especially bees, because they themselves don't know enough to teach them right from wrong in this regard? With evangelical zeal, it is important to correct this thought process. In the course of this attitude change, you will find people responding not only positively, but welcoming your efforts to add space in your neighborhood for honey bees.

If we start from scratch, with changing people's perceptions about honey bees, we have a much better chance of attracting people who will become interested in the activities of any organization that promotes their care and nurturing. If you are successful in changing perceptions, you have the ability to gain converts.

If you have, or are thinking about creating, your own local organization of beekeepers, all it takes is shared goals, progressive thinkers and a bit of work spread out over the members. To the members of the Back Yard Beekeepers Association (BYBA), an association open to serve all geographical areas, but primarily serving beekeepers located in southeastern New York and southwestern Connecticut, a membership person or committee is vital, for obvious organizational reasons. Having an individual or group within your own organization to accept the challenge and pursue structured goals for numbers of members gained in a given time period is crucial. Once your club is established, guidelines or goals may be set, and just like in the real world of commerce, working to make those goals a reality becomes incumbent upon all members for the sake of the organization. However, it is also necessary for the membership chair to be outgoing, well-connected, well-organized, and have some "community capital" (a way to gather in favors) to put forth in the process. He or she may then go about the pleasant chore of determining by what factor or number the membership goals should be raised, by what methods, and by who doing what to get there. And of course, it certainly helps to have the consent of your

board or a general consensus of the membership to ratify your plan. Only then will the goals be realized.

Generally speaking, local garden clubs, Audubon Societies, nature centers, conservancy centers, farm cooperatives, etc., make wonderful areas to cultivate and establish beekeeping enthusiasts. These existing locations that cater to the wonders of the natural world make easy the job of finding an interested audience. It should be noted that Kiwanis, Rotary clubs, Elks and other groups meeting once a month or more are always looking for active community members that have information to share with the world. Making yourself available and known to these organizations will earn you not only the ability to share your knowledge of your hobby, but also assure your group a proper air of establishment, professionalism and pride!

The BYBA is a growing and vital part of the beekeeping landscape because of several factors, not just because of the membership chair! To coordinate all that is needed within a progressive organization, our president was critical in syncrhonizing other activities to coincide with membership. For example, membership was green-lighted to create a simple brochure, highlighting all the activities and benefits of being a member. All upcoming events within the organization were noted, meetings (and their main topics) publicized, as was a synopsis of our many services to members. Included was a list of the current 30 or so officers and directors of the organization so that, if anyone had any questions, they could be easily directed to an appropriate member. Many of us have e-mail so that communication within our own organization is easy and direct. This simple brochure has now become our standard "leave-behind" piece when reaching out to potential members or when visiting with the public in general.

Coinciding with the efforts of membership is the publicity committee, whose events become opportunities for each to feed off the other. By hosting a booth at the local farmers' market, we become visible, and produce a modicum of profits to offset the operating costs of the organization. Our monthly meetings are open to the public, and new prospects are actively invited and most welcome to join in our presentations, lectures and camaraderie. There is a speakers' bureau within our organization, so that as we are invited to speak to various groups, we have the capacity to do so with organized presentations given by knowledgeable presenters. Of course, virtually every valid organization these days has a presence on the World Wide Web. Ours is no different, thanks to our volunteers especially knowledgeable in such matters.

Above all, there is a fundamental goodness to all we give our members, and that is what is especially important for the retention of members. We all know that beekeeping has its fits and starts, especially for beginners, and we have a well-used group of "old-timers" to counsel and comfort those in need of both virtues. Excellent quality events cap our once monthly meetings (except during July, August and December), highlighted by knowledgeable speakers, constructive venues, supply dealers, Q&A sessions, etc., determined by the season. This gives us an extremely high retention rate of well over 90 percent, for our members don't just belong to some ragtag organization, but the organization becomes a highly integral part of their individual beekeeping experience. A network group just for the hobby of beekeeping! That concept and its execution makes our annual dues of only $25 a real bargain. Not to mention the newsletters, special offers, self-help, and so on.

The BYBA has just recently established an observation hive at our local Audubon's State headquarters. The executive director and the program director both enthusiastically embraced the idea of this observation hive (which the BYBA donated and maintains), around which they are building an indoor display showing the wonders of bees and their interaction with other living things in our natural world. Our BYBA literature is prominently displayed, and in it, the public is made welcome to call on us to answer questions about bees or beekeeping. We feel strongly that this "beachhead" will serve our organization well down the road as many more people will feel differently about bees in general, and a few will be thrilled enough by our presence that they might decide to take up beekeeping on their own.

And that's the point! Good luck with your membership! BC

Winthrop E. Baum is membership chairman and a director of the Back Yard Beekeepers Association. He was looking for a source of pollination three years ago for his small gentleman's orchard farm in Fairfield, Connecticut, and found the satisfaction of beekeeping. When not gently altering the landscape and what it yields on his property, Win is active as a commercial real estate broker/developer. You can contact him at win@winbaum.com

James E. Tew

Bee Culture's Beeyard

Aging Beekeepers and Aging Equipment

Since we talked last month, the demonstration yard has gone into full operation. Though I planned and planned, when the season finally started the intensity was surprising. Though I have worked with bees for many years this is the first time in a long time that I have specifically started hives and established a yard using hobby-type principles. I was interested to observe that some things never change. I had planned to establish about five colonies and maintain them intensely. I have eleven already. When I first started beekeeping in 1974, I had two colonies and I immediately wanted thousands. At 200, I finally burned out and dropped to a more manageable number. It seems as though I have learned nothing about "getting in too deeply." Editor Flottum is worried.

The Packages Arrived As you may recall from previous articles, I ordered two packages from Harrell & Sons, in Hayneyville, Alabama. They were shipped to me in good shape and right on schedule.....but my schedule had changed by the time they arrived. I had pressing pollination research to pursue and let the packages sit for a couple of days. As the weekend approached I began to make plans to cool them and hold them until Monday. Keeping them over the weekend was going to be clumsy so I abruptly decided to install them immediately. You know how abruptly-made decisions frequently end.

I suspect that you also know how to correctly install packages already. To summarize the procedure, keep the packages cool and dark until you are ready to release them. Feed them frequently with sugar syrup sprayed from an atomizer to keep them content. Ideally, release them late in the afternoon. If you can give the new package a frame or two of drawn comb, so much the better. Open the package, bounce the bees down and remove the queen cage and the

A prototypic garden hive. The side door is a glass-covered window.

A simple bench made from an old deep hive body.

Yard Breakdown *Colony Number: (Clockwise)*
1: Cordovan Queen (From overwintered nuc)
2: Cordovan Queen (From overwintered nuc)
3: Swarm Queen//Slatted Rack
4: Natural Queen (From overwitnered nuc)
5: Swarm Queen (approximately 3 pounds)
6: Harrell Queen//Warm-Way Entrance//3-pound package
7: New World Carniolan Queen (5-frame split)
8: New World Carniolan Queen (5-frame Split)
9: Harrell Queen//Warm-Way Entrance//3-pound package
10: Prototypic Garden Hive with Natural Queen (5-frames)
11: Swarm Queen//Bottom ventilator//approximately 2 pounds (at far right out of photo)

feeder can. Temporarily replace the cover over the package opening to keep bees from escaping before you are ready. Back to the queen cage. Remove the plug from one end in order to expose the candy plug and put the cage where you can find it quickly. I recommend a shirt pocket. Back to the package. Bounce the bees briskly and pour the bees into a space left by removing three or four frames. Bounce and shake the package in order to get bees out as quickly as possible. At this point, bees are flying everywhere. Position the queen cage near the center of the hive between frames with the screen side accessible to the bees. Replace frames as well as possible, close the colony and call it a day. In two or three days, gently open the colony, remove the queen cage (release the queen if she is not already out), destroy any burr comb and replace all frames. Keep sugar syrup on the colony. That's it in less than 300 easy words.

In my rush to release the packages, and since none of you were there to watch me cut corners, I didn't take time to spray the package with sugar syrup – at any time – during the procedure. Other than that omission I quickly did everything as I described above. I immediately had thousands of bees in the air. I released both packages within minutes. I was in a hurry. When I finally had a moment to check out the scene, I was shocked to see that **nearly all** the bees were in the air. I was expecting to have more bees in the air than usual – but not all of them. I recall thinking, "Am I going to write about this?" Once the bees are released, there is absolutely nothing one can do. I left the yard to perform other tasks and literally left a cloud of bees in the air. I admonished myself for knowing better but not doing better. When I returned, just before dark, everything had settled down, but one colony was nearly twice as large as the other. I will now need to equalize them later, but for now they look good. In future rushes I will not omit sprinkling with sugar syrup.

New World Carniolans I bought two splits locally that are headed with queens of the "New World Carniolan" variety. The splits were strong and the queens were quiet and very dark – nearly black. I picked them up in corrugated-board nucs. I fretted for a few days until I could get back to them to covert them to standard equipment. Making that transition was uneventful – for which I was appreciative. The colonies – so far – are active and gentle.

Cordovan Queens I had the opportunity to purchase three Cordovan queens that were produced by Koehnen & Sons in California. They are as orange as the carniolans are dark. But there is a story here. The queens came in cages with no attendant bees. I came straight to the yard and put them in a colony for nurturing until I could make splits or requeen. I did not notice that the candy plug was not protected. I know, I know, I suppose I should have checked that, but I have never had that happen before. By the time I realized my error one of the queens had been released and was killed by bees within the colony. I now have a $10.00 queen stuck on a pin for teaching purposes. The other two are happily heading colonies that were previously swarms.

The Tenacious Splits For those who have not read previous articles in this series, I had three established colonies die this past winter from tracheal mite infestations, while, to my surprise, three neglected 4-frame nucs survived the winter reasonably well. After late winter/early spring was well underway they built up nicely. In fact, one swarmed already. I captured the swarm and placed it in the yard. It is currently colony #11, but is showing signs of a chalkbrood infestation. No doubt, hundreds of times, I have instructed beekeepers to requeen swarms and I planned to do that with the cordovan queens. I found the swarm queen and did not have the heart to eliminate her. I know all the reasons why I should, but I just could not do it. It is as though I knew her personally. In spite of all beekeeping logic she still heads the colony and is one of the survivor queens from one of the nucs. I will try to address this situation in upcoming months.

Swarms Including the swarm just described; I picked up three swarms – mainly from our other colonies. They were good-sized swarms and I put them on full frames of honey I had from previous Varroa-killed colonies. Typical of hard working swarms, they built up nicely and are established colonies now.

The Twin Curse of Aging Beekeepers and their Aging Beekeeping Equipment My next series of

Continued on Next Page

BEEYARD ... Cont. From Pg. 31

thoughts and comments probably border on beekeeping heresy. To those who are offended I apologize in advance. I have deeply enjoyed working with these splits and nucs. They are light, friendly, and the queen is easily found. I actually have a sense of dread as the colonies grow, becoming increasingly heavier and heavier. I realize that at nearly 51 years of age I enjoy beekeeping and bee biology, but I do not require 5000 pounds of honey and all its ancillary processing equipment to be satisfied with my beekeeping project. It seems to be increasingly heavy and sticky. Sweat runs across my bifocals. My back aches, and my truck steering wheel is sticky on my drive home. And this is a pleasurable hobby? What am I trying to say? Bee hives are predominantly kept for honey production and pollination, but I keep bees for enjoyment. Excessive honey production does not bring me the pleasure that it once did a few years ago. Am I opposed to honey production? Absolutely not! I just want someone else to do it. We have bred bees for massive honey crops. I am increasingly wondering why bee populations just come in one size – extra large. We have compact cars, bonsai plants, lap-top computers, small microwave ovens, and chainsaw lumber mills that will fit in the trunk of you car. We are adept at miniaturization. Yet bee hives come in one size – extra large.

I have built a prototype of a hive that I have called the, "Garden Hive". My wife says it is cute at best and very nearly ugly at worst. It will swarm excessively and has attributes that are not conducive to maximum honey production. But it's easy to work and is friendly. Backyard gardeners have shown a degree of interest in such a manageable unit. For such incidental people and for aging beekeepers like me, I will continue to explore the "downsizing" of some of my colonies. Please don't think that I am abandoning all interest in production colonies. Not true. I just am not sure that *one size fits all* in beekeeping.

In both my personal life and in my university life I have accumulated piles (not stacks) of good, junky hive equipment. What to do with all this stuff? Occasionally, I am overwhelmed and torch piles and piles of it. But just like the old queen discussed above, sometimes I cannot bear to destroy a tiring piece of equipment that still has some life left in it. In years past, I have built drawers for my woodworking shop and tool caddies – all made from bee boxes. In fact, I have considered writing a piece called, "Bee Hive Furniture for Humans", but have not pursued the project. The significant fact is that bee hive finger joints are strong joints with multiple uses – not just in beekeeping.

Laugh if you must – others have – but I improvised a small bench (table?) from a failing deep hive body in fifteen minutes (real time) using minimal tools. Select a bee box (you choose the size), with one unsound end or side. Avoiding nails or staples, cut off the damaged side or end. You are now left with a "C-shaped" structure. Cut an arch in both ends. I cut mine in such a way as to eliminate the handholds on the ends. I cut a piece of scrap lumber about 3 inches wide for an inside brace. I put one screw in each end and two in the top and called the project finished in fifteen minutes – start to finish. I left on much of the wax and propolis as well as my branded name. I did no sanding. I freely admit, "It ain't much", but it is a quick useful bench that was not destroyed on the burn pile. What to do with it? Put your feet on it. Put a flowerpot on it. Use it as a low workbench. Give it to friends you don't care very much for.

This entire concept evolved as I tried to accumulate enough sound equipment to house more that twice the number of colonies that I was prepared to handle. I quickly became bored with scraping and banging on old equipment and frames in order to make them useful again. If a theme seems to be developing that I am lazy and poorly prepared, dash the thought. I work hard, but am constantly pushed for time. Who isn't? Should I repair this piece, trash this piece, or buy new equipment, are constant questions that I must address. Currently, I am trying to devise a use for several thousand old frames for something other than kindling. I'm thinking of some kind of flying machine. (I'm just kidding.)

In the Yard During this past month, I have been cutting grass and applying weed killer around the hive stands and around the bee shack. Not exciting work. I ordered two yards of mulch to go over the killed grass, which arrived in early June. I have not been able to get all the equipment painted before I had to put bees in it. Now I will be forced to paint equipment with bees living in it. More on that next month. For my beekeeping amusement, I have put on a bottom ventilator for which I found plans in an 1869 beekeeping book, a slatted rack, and I have built a bottom board that will employ the "warm way" entrance. Again, more on these pieces in upcoming articles. I plan to review the concept of "follower boards" or boards that replace one frame within a ten frame colony. Removing this board is much easier than removing the first frame from a tightly packed ten-frame colony. I am using quite a bit of plastic frames with wax-coated plastic foundation. It is fast and requires no frame assembly. So far the bees seem to like it okay.

Epilog I have sincerely enjoyed playing with my bees. Though I frequently cut grass in the rain and cut corners on hive management I do the best I can with the time I have. The bees seem happy enough. Enjoying beekeeping is an important component of hobby beekeeping. Keep looking for ways to keep it pleasurable. BC

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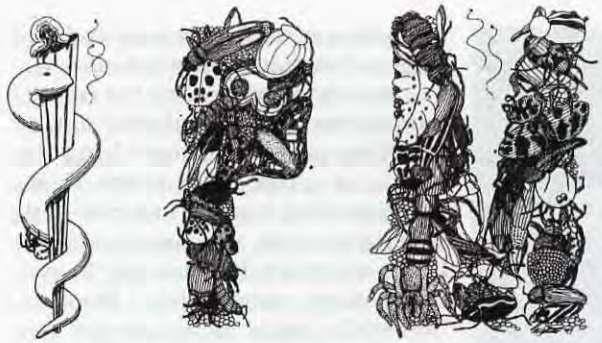

Integrated Pest Management
Minimize Stress
Promote Health

FIRST, DO NO HARM

Nick Calderone

In April's introduction to IPM, I listed your management system as one of the major cultural tools at your disposal in your effort to minimize damage to your bees from pests, parasites, pathogens and predators. While management practices are usually used to help your bees recover from various maladies, they can also be used to prevent your bees from becoming sick in the first place. Bees, like any living organism, thrive in some environments and experience stress in others. A number of conditions, like European foulbrood and chalkbrood, are thought to be at least partially stress-related conditions. Stress can also affect the life span of the adult bee and, thus, the size of the colony's population. This, in turn, will be reflected in diminished crops and weaker colonies going into Winter. Your management system, more than any other single factor, defines your bees' environment.

It is important that you understand your role as your bees' physician. Remember – the first rule of a physician is 'Do no harm.' Beekeepers should heed this counsel as well. Everything you do to your bees should promote health and minimize stress. In this column, I want to discuss some basic management practices that will help you provide your bees with the environment necessary to attain these goals.

Selecting the apiary The most important decision you make for your bees is your choice of apiary locations. Choose wisely, and your bees will prosper. Choose poorly, and they will perish. There are a number of DO's to keep in mind when selecting a location.

SELECT A SITE WITH . . .
- Dry, well-drained ground
- Plenty of sun throughout the day
- Protection from prevailing Winter winds - when evaluating a location, think about how well-protected it will be when all the leaves have fallen from the surrounding trees and bushes in the Fall
- A gentle slope to ensure adequate air drainage
- Good road access - check out prospective locations in the fall or spring, when the ground is likely to be wet
- Protection from vandals
- Productive nectar and pollen *flows throughout most of the season*

There are also a few DON'TS you should keep in mind:

DON'T SELECT A SITE . . .
- In a wet or boggy area
- In a low area or in an area subject to flooding - cold pockets can develop in low-lying areas, and heavy rains can cause flooding
- On a hilltop - hilltops tend to be windy and this discourages foraging in the Summer and makes the bees work harder to keep warm in the Winter
- Close to your neighbor's property line - bees can cause problems with pets and with people – they can also leave quite a mess during 'cleansing flights', causing

Different colors, appropriate stands, the right direction and clean equipment all contribute to a healthy colony.

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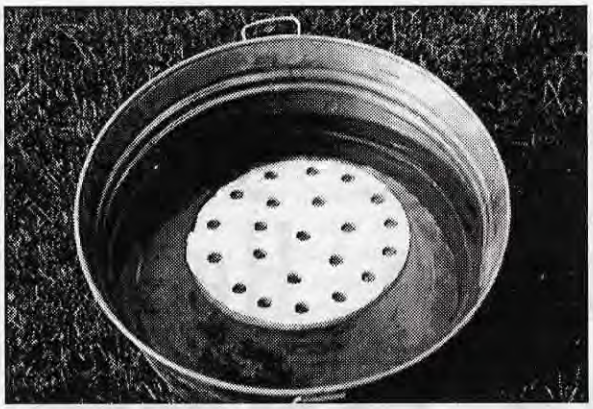


No matter how you supply water – supply water. It not only helps keep bees out of your neighbor's way, but reduces travel time, and stress.

damage to cars, houses and other surfaces

Where your bees are likely to be poisoned by pesticides - explore the area around any site you are considering for an apiary - apple orchards are great during bloom but can cause problems after petal fall - areas where lots of sweet corn is grown can cause problems with Penncap-M

Most locations will possess several desirable traits, but will lack others. A location may be excellent for the production season, yet it may be very poor for wintering, and vice versa. If you don't mind moving your bees, you can use two locations, one for making honey and the other for wintering. Remember a Winter yard can support a lot more colonies than most Summer yards, so you don't have to have as many in Winter as Summer. You may also want, or need, more than one Summer location, each with a major flow that occurs at a different time during the season. Make a checklist and evaluate several potential locations before making a final decision. Always evaluate your locations from the bee's point of view.

Siting your colonies Site your colonies on stands that raise them between 4 inches and 8 inches off the ground. This will keep the bees dry and warm and will keep the entrance above the grass. It will also protect your equipment from moisture damage. There are many types of stands. A couple of cinder blocks will work fine. A two-hive stand or a pallet that holds four hives allows you to push your colonies together for wintering, thereby reducing the surface area to volume ratio. This means that your bees will lose heat less rapidly. A major disadvantage of multiple-hive stands is that you sacrifice accessibility to your bees, so it is more difficult to work them. This can be very annoying.

Face your colonies somewhere between southeast and south. Make sure that they are in full sun on the south side. This will help warm your bees, especially in the morning. Tilt your colonies forward about 5 degrees, just enough to ensure that water does not collect on the bottomboard. Another problem to avoid is drifting. Drifting can spread diseases and mites. If progressive, it will significantly weaken some of your colonies, and they will make less honey. You can minimize drifting by placing your colonies in an irregular pattern within the apiary. The use of colored landmarks - signs - can also reduce drifting.

Nectar and pollen flows Beekeeping is a lot like the stock market. Everyone thinks he is an expert when the market is going up, but the real expert makes money when the market is going down. So, too, a good nectar flow makes everyone think that he is a good beekeeper, but the real beekeeper can make honey even when the nectar flow is poor and his neighbor is feeding his colonies.

Become familiar with the nectar flow patterns of each of your apiaries. This gives you something by which to gauge each year's flow. When you find yourself in a year that is below average, you can move bees to an alternate location or, in extreme cases, provide feed. Remember, while nectar flows usually exhibit broad regional trends, there can be considerable variation *within* a region, whether the year is above or below average. Some locations can support a seemingly unlimited number of colonies in a good year. But in most years, most locations support a limited number of colonies. Overstocking an apiary can seriously diminish the average yield per colony. It can also reduce the size of your colonies. As a result, you will lose out on any subsequent crops that year; and your bees may be too weak to winter. Careful production records, a scale colony in every yard, and several years of experience are your best tools for learning the value of each of your apiaries. Nothing makes for a healthy colony like a good nectar and pollen flow.

"Your management system, more than any other single factor, defines your bees' environment."

Overheating Overheating places your bees under stress. You can reduce overheating by painting hives white or some other light color. Aluminum paint, especially on your outer covers, is also suitable. If you live in an especially hot region, you will want to locate your bees so that they do not bear the brunt of the midday sun. An upper entrance can also help. It will allow for airflow through the hive, and this will help the bees regulate the temperature and speed the drying of nectar.

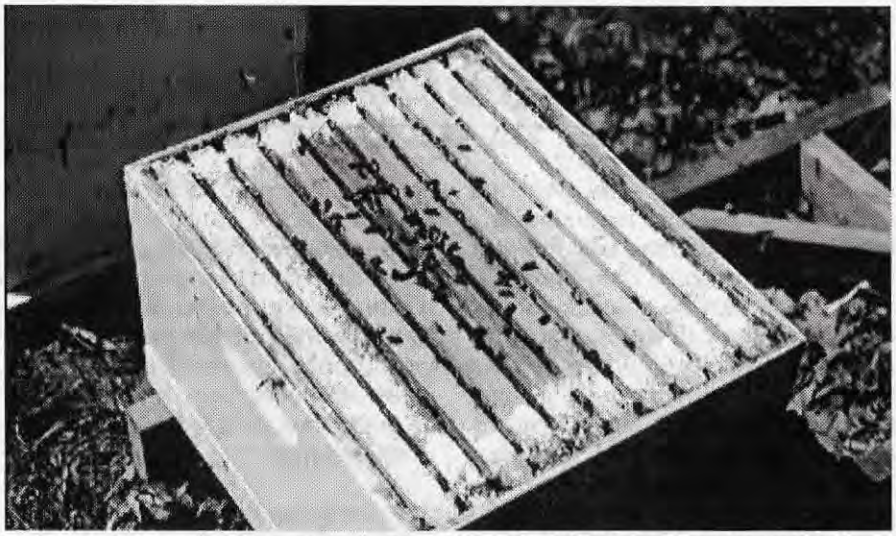
Supplemental water is essential during dry spells and hot weather. Bees need water to cool the hive and to rear brood. Water comprises about 66 percent of brood food and is essential to the maintenance of the proper humidity in the brood nest. If your bees do not have ready access to a continuous supply of

fresh, clean water - within a quarter mile - you should provide it. A galvanized laundry tub or 5-gallon plastic pail will work fine. Place the water near the bees and change it weekly. Be sure to use floats on the water so that the bees do not drown. Providing water will also reduce the chance that your bees will become a nuisance during hot, dry spells when they will forage for water wherever they can find it, even in a neighbor's garden fountain or swimming pool.

Feeding your bees When there is a dearth of nectar, colonies will reduce brood rearing and begin to consume their stores. Depending on when this occurs, colony populations may dwindle and be too small to winter or to make a crop. Full-sized colonies with less than three combs of stored honey are at risk. If you find a colony with honey stores below this level during the Summer, feed one gallon of sugar syrup (1 part granulated cane sugar to 1 part hot water) for each comb below this level. Colonies can also experience a pollen dearth. Pollen is essential for brood rearing, and bees will cannibalize existing brood if they experience a dearth of pollen in the field. If you notice brood being eaten, a lack of stored pollen, and a lack of foragers returning to the nest with pollen, you should feed the colony a pollen substitute or supplement. Or, you could move your bees to a better location.

Moving bees Moving bees is often necessary, but it is not without risk. Bees can overheat and die, and queens can be lost.

If you move bees when it is warm out, use a top screen to provide ventilation. This is especially important for strong colonies or whenever the bees will be confined for a drive of more than a few hours. Be sure to load your bees so that the *combs run parallel to the road.* This will keep them from swinging together when you are starting and stopping and will prevent bees (and the queen) from being crushed.



Appropriate medications, correctly applied, at the right time – important rules for healthy colonies.

Move bees at night or on cool or rainy days when there is no flight. If you move them on a nice day, you will lose your foraging force. When moving bees, follow the rule - 'Less than a foot, more than a mile" - although I would suggest more than two miles. Bees orient to their colony's entrance. If you move them more than a foot, but stay within their established flight range, they will return to the site of the original entrance and be lost. You can lose your foraging force this way, as well. When this happens, the food supply line that the nurse bees are drawing on to produce brood food is disrupted. This places your bees under great stress. I have seen colonies moved short distances come down with serious cases of EFB and chalkbrood from which they never recovered. If you move your bees more than two miles, most of the bees will find themselves in an unfamiliar environment and will reorient to the new location.

Occasionally, a property owner will let you site your bees on his land, but soon ask that you move them a few yards or so after they have oriented to their entrance location. This can create a lot of work for you, because you will have to move them two miles away for two weeks, then move them back. It is also an extra move for the bees, and that means extra stress. Be sure the property owner understands that your bees cannot be easily relocated once they are set down.

Chemicals Sometimes, chemicals must be used to prevent AFB or to control parasitic mites. Misuse of Terramycin can cause brood mortality. Be sure that you use the proper dose applied in the proper manner in a ring around the brood nest. Non-registered formulations of Amitraz, Apistan and Coumaphos are not only illegal, they can also be toxic to bees because proper application rates have not been established and because they contain solvents that are toxic to bees. You also increase the risk of contaminating your hive products. Pesticides and formulations that are not registered for use in bee colonies should NEVER be used on bees.

Recently, there has been considerable interest in the use of es-

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KEY WORDS

Management system - *an organized set of manipulations that you perform on your colonies to achieve specific goals*

Stress-related condition - *an adverse condition caused by subjecting an organism to one or more environmental conditions outside of its optimal range*

Dearth - *a period when there is no nectar or pollen available for the bees in the field*

Sub-lethal effects - *damage that does not result in the immediate death of an organism but that shortens its life-span or compromises its ability to function normally*

"Evaluate your locations from the bee's point of view."

sential oils for control of parasitic mites. Essential oils may someday play a role in mite management, but they also carry some risk. Many essential oils can be toxic to honey bees as well as to mites. You may not see a large bee-kill, but the bees may suffer from *sub-lethal effects*. Generally, these are not noticed by casual observation, but they can have a significant and negative impact on your bees. Remember! Anything that shortens the life of a bee will weaken the colony, reducing its honey producing capacity and its ability to successfully winter.

Requeening Keep young, vigorous queens in your colonies at all times. Queen failure will significantly weaken a colony, and that will reduce its ability to produce a crop and to successfully winter. It is absolutely essential that your colonies have young, vigorous queens going into Winter.

Pollination Renting your bees for pollination can place them under considerable stress, both from the move and from conditions found onsite. Some crops, like melons, squash, cukes and cranberries, generally yield little nectar. Other crops may yield nectar, but colony density during pollination is so high that individual colonies do not get much in the way of pollen or nectar. Lowbush blueberries in the northeast are one example of such a crop. Other crops produce limited amounts of pollen or pollen that is not, by itself, adequate for rearing healthy brood. The result is that your colonies rear less brood, consume stores, and often break down with EFB or chalkbrood. Provide your bees with a slow-release pail of syrup and possibly a pollen patty while they are working these crops.

Bees in pollination are often within a stone's throw of bees from half a dozen other beekeepers. This situation is conducive to the spread of mites, AFB and other diseases. If you are going to place your bees in a high-density situation, be sure that you are using Terramycin as a prophylactic against AFB. Make your last application 45 days before you plan to super for honey production. This would also be a good time to be treating for *Varroa*, but you will have to remove the strips before adding your honey supers. Follow these rules, and your bees will come out of pollination in good condition for making honey.

Overwintering Beekeeping is a cyclical enterprise. Your success in one phase of the cycle depends on your success in the previous phases. A successful production season begins with strong, healthy colonies in the Spring. This requires careful planning and attention the previous Summer and Fall. Colonies must go into the Winter with strong populations of healthy bees and with adequate stores of honey and pollen. One of the biggest mistakes I see beekeepers make is attempting to winter weak or marginal colonies. The old adage - "Take your losses in the Fall" - is often ignored. Weak colonies should be thoroughly inspected in the Fall to determine the cause of their condition. Any colony that is heavily infested with mites or disease a month before the Fall flow is over should be destroyed. Treating a colony at that time may eliminate the problem, but it cannot buy the time necessary to produce a healthy flush of new bees for Winter. The bees that are present are probably of poor quality and may be more of a detriment to another colony than a benefit. So, take the extra honey, and use the income to buy a package or nuc next Spring. Colonies that are weak because of queen failure or poor nectar and pollen flows earlier in the season should be combined with moderately strong to strong colonies. Uniting weak colonies with each other is not likely to produce a strong colony.

Colonies should have adequate stores of high-quality feed on which to winter. Those with inadequate stores should be fed. The best Winter food is capped honey from a disease-free source - which generally means another one of your colonies that you know to be free of disease. Be sure that it is not crystallized. High-fructose corn syrup (e.g., Crystal 55 from ADM) and sugar syrup (2 parts granulated cane sugar to 1 part hot water) also make suitable Winter feeds. Beet sugar has a higher percentage of ash and is not a good bee food.

Colonies must also have enough pollen stored in the Fall to support brood rearing during the late Winter and early Spring buildup when fresh pollen is not yet available in the field. Colonies going into the Winter without stored pollen have been shown to be 72 percent smaller in the Spring than colonies with adequate pollen stores. How much pollen you need depends on how long your bees will be without natural forage. In the northeast, bees typically go without natural forage from mid- to late October through early April. Under these conditions, I recommend 500-600 square inches of pollen in the center combs of the upper brood chamber.

Early inspections Be sure that you make a late-Winter inspection. You need to know if your bees are alive and if they have sufficient food to get them through until nectar and pollen are available and accessible in the field. You shouldn't break the cluster at this time, but full combs of capped honey can be used to replace empty combs on the sides of the cluster. Do not remove brood at this time because low temperatures and brisk winds will chill it.

Beekeeping is a highly skilled enterprise. It takes a lot of know-how and a commitment to carefully designing and implementing a management system that reflects a thorough knowledge of the bees' biology. Never underestimate the value of providing the optimal environment for your bees. If you incorporate the recommendations presented here into your management system, you will help your bees maintain vigor and health. Of course, your management system must also have carefully outlined procedures for controlling pests, parasites, pathogens and predators. In my next column, I will outline an IPM program for control of parasitic mites. BC

Nick Calderone works in Apicultural Extension and Research at Cornell University, Ithaca, NY.

COMB HONEY HARVEST

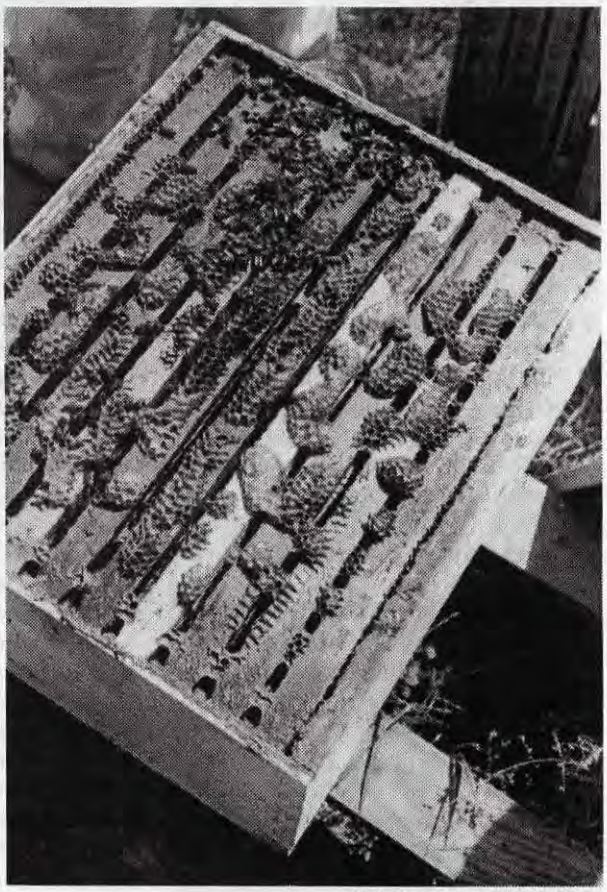
Lloyd Spear

Production of comb honey is an art but, thankfully, one that can be easily mastered if you're willing to pay attention to detail. In the previous two articles we discussed the advantages of producing comb honey, the equipment and assembling for production, when and how to super, and, of extreme importance, how to control swarming. In this article, we will review harvesting, Fall management and wintering. In a later article marketing and packaging will be discussed.

Comb honey supers need to be put on the hives a few weeks before the major flow. The bees will first draw the combs in the super immediately on top of the brood nest and will fill the cells with nectar as fast as the combs are constructed. As the bees tend to first construct comb in the back of the hive and will often favor one side over the other, it is usually wise to rotate the super at least once. When producing cut-comb or combs for chunk honey, it is also a good idea to exchange the end combs with those in the center. Do this when the center combs are fully drawn and partially capped.

When the super immediately over the brood nest has the comb in all the frames drawn and 50% or more capped, it is time to rotate supers. The procedure and rationale for doing this was explained in detail in the preceding article. On the next trip to the hive, in about a week, carefully look between the frames to see if the top cells are capped. If so, tip the super up and look at the bottom of the frames. If more than a few cells are still uncapped, leave the super for another week. If all the cells are capped or only a few cells are uncapped, the super is ready to take off the hive. It is important that this is done as soon as possible, otherwise the bees will discolor the cell cappings by walking on them with their dirty feet!

The next step depends on whether there is burr comb between the supers or between the super and the brood nest. If you see broken comb and honey on the bottom or top of the frames in the super to be harvested, you have burr comb. The bees build burr comb when they have excessive space (generally, more than 3/8th of an inch). The burr comb will be full of honey, which will drip on your car or truck, your clothes, the basement floor, etc. To prevent this, when the super is ready for harvest, scrape all burr combs, discarding the wax into your wax melter or collecting it in a bucket for later processing. Put the super back on the hive. The bees will immediately set to work to clean up the spilled honey, and if you come back in 2-3 hours or in the morning you will be able to harvest a nice dry super as the bees will not have had time to rebuild the burr comb.



Burr comb, like this, needs to be broken and bee-cleaned before you harvest.

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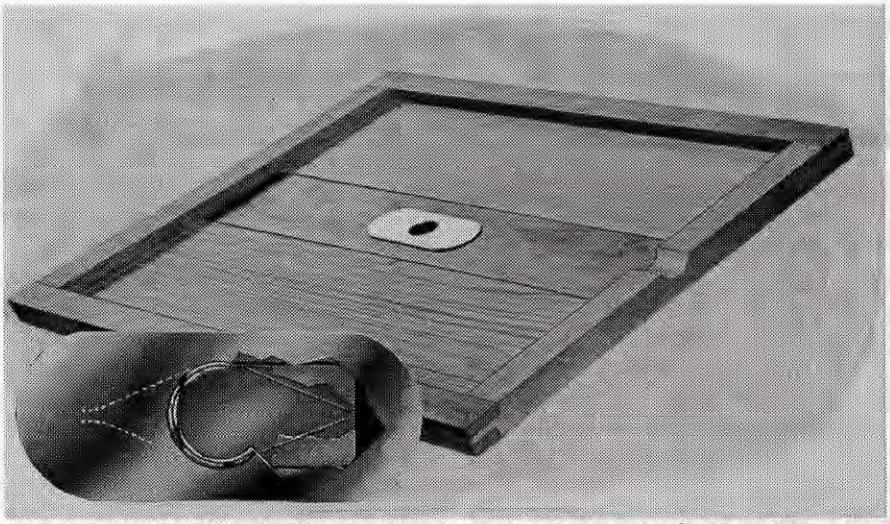


An inner cover outfitted with as escape. Escapes are one-way devices. Bees enter the hole from the center, usually from honey supers above, and exit into the brood area, leaving beeless supers. Sometimes the escape is placed to allow bees to leave supers and go above and exit the colony.

While I do not believe bees guard their honey as such, they certainly guard their hive and it will be easiest to harvest and process the comb honey without the super being full of bees. There are four basic methods of getting the bees out of the super. Those methods, and the advantages and disadvantages of each are:

1. Insert a bee escape device between the super to be harvested and the rest of the hive. There are many such devices, but the two most popular are a Porter escape, which fits into the hole in the inner cover, and a special board including a maze that lets the bees move into the super below but seems too confusing for them to negotiate re-entry. The advantages of these escape devices are that they are non-chemical and can be inserted without disturbing the bees.

   The disadvantages are that at least 48 hours is normally required for the bees to leave the super and on a hot day the devices can interfere with air movement to the extent that the combs will melt, ruining the product of all the bees' (and the beekeeper's) hard work.
2. Remove each frame and brush the bees off with a bee brush or a handful of grass. This certainly works, but is very time consuming and can make the bees very angry. Again, this is a non-chemical solution.
3. Use an air blower to blow the bees out of the super. This non-chemical method will quickly remove bees and, for some unknown reason, does not make the bees angry. The only disadvantage is the cost of the blower. However, more and more homeowners are using leaf blowers and many work fine for this purpose.
4. Use a fume board and one of the chemicals that act as a bee repellent. The advantages are that this is very fast and does not make the bees angry. The disadvantages are that these chemicals smell terrible to humans as well as bees.

Personally, I use a fume board and a repellent and have never been able to detect any smell or taste effect on the honeycomb. When temperatures exceed 75 degrees, when almost all comb honey is harvested, the fume board will only need to be on the super for 1-2 minutes to drive over 95% of the bees down. I have timed it, even two minutes is rarely necessary. I don't believe that taste or smell can be affected with such short exposure.

Once the supers are off the hive, you have to decide when to treat for wax moth. The supers almost certainly contain some wax moth eggs, hidden in crevices. If untreated, they will hatch and the small larvae will go looking for food. While they are unlikely to find any (their principal food is the cocoon fragment left behind by hatching bees), they will make unsightly "tracks" across the cappings and may even grow enough to be visible! To kill the eggs, as well as any tiny larvae that might have already hatched, it is necessary to freeze the combs.

We have a chest freezer and I usually find it easiest to freeze the entire super, but one can freeze individual frames or wait and freeze the finished packages. Regardless, put the material being frozen *inside a plastic bag and when thawing leave it in the bag for at least 12 hours.* When warm air meets the frozen material, moisture will condense. By leaving the comb in the bags the moisture will be on the outside of the bag and not on the combs, where it is unsightly. Be certain your freezer can reach 0°F and freeze for at least 24 hours after 0° is reached.

The freezer is one piece of equipment necessary for harvesting comb honey. Most beekeepers already have one in their home and can make room for a few days of freezing comb. The only other piece of equipment that is needed is a sharp knife. The use of the knife will vary depending on whether one is producing cut comb, chunk honey, or Ross Rounds™.

As production of comb honey requires strong, compared to gradual, flows, most comb honey production is over during August. This is an enormous advantage for comb honey producers as:

- the entire fall flow from goldenrod and aster can be left with the bees for over-wintering
- treatment for Varroa can be applied in mid-August, easily providing a full treatment period before really cold weather.

In most areas of the country bees used for comb honey production will have ample time to collect a full super of honey from the fall flow. This will provide food for overwintering, as well as stores for the following spring's brood rearing.

Beekeepers who want the fall honeys for extraction must keep supers on until first frost. Thereafter they pull supers and treat for Varroa, and sometimes have significant winter losses because the treatment period was too short before the bees went into winter clus-

ters. Comb honey producers, who can remove all supers by mid to late August have plenty of time for a full treatment period.

In southern states bees need as little as 30 pounds of honey for the winter. In most of the country, 60 pounds is sufficient, but in the far northern parts, 90-100 pounds is required. If there is not a bee club in your area, a call to your county extension service will give you the name of a local beekeeper who you can call to ask how much stores are required in your area. Experienced beekeepers can walk behind their hives and approximate the weight by gently lifting the back with a hive tool. Until this level of experience is gained, a bathroom scale can easily be used.

Working from the back, prop up one side of a beehive with a piece of 2 X 4. Then lift the other side and slide an ordinary bathroom scale underneath. Read the weight and, since one side was supported on a 2 X 4 and not the scale, multiply by two. This is the weight of the hive. Subtract 20 pounds for each hive body, and you have the approximate weight of the honey.

Since the bees will not readily take feed after they form their winter cluster, the weight needs to be checked after hard frost (when there will be little to no further amounts of nectar), but before daytime temperatures are constantly below 50 degrees. If you do not have the minimum amount of honey for over-wintering in your area, feed sugar syrup. Fall syrup should be two parts sugar to one part water (by weight or volume). This mixture will weigh approximately 12 pounds to a gallon. Feed the required amount, using either a bucket or a hive top feeder.

While it is controversial, in the most northern parts of the country wrapping hives will probably improve the percent that over-winter successfully. Again, inquires should be made to your local bee club or experienced beekeepers in your area. In most of the country, wrapping is definitely not necessary and bees can easily withstand the cold, while getting enough days of moderate temperature so that they can move their cluster to new frames of honey. What kills most bees during the winter is excessive moisture.

During the winter bees eat honey for its carbohydrate value and shiver to generate heat that is used to keep the cluster (including the queen and any small amounts of brood) warm. This heat, of course, produces moisture (from the honey and the bees) and rises. Since the bees do not heat any part of the hive where they are not clustered, the rising heat will meet cold air, where the moisture will immediately precipitate, "raining" cold water down on the bees. The bees cannot cope with this cold water, and it will (and does) kill them. Once the bees have sufficient stores for the winter, the most important matter becomes a method for dealing with the moist warm air to prevent water condensing down on the bee cluster.

When complete, a round section will have some excess foundation still attached, easily removed with a sharp knife. (Richard Taylor photo)

Techniques for dealing with this moisture vary enormously, and the technique is less important than consistent practice. The techniques can be divided into two principal areas: (1) removing the moist air from the hive and, (2) capturing the moisture inside the hive so it cannot condense and drip down on the bees.

Moist air can be removed from the hive by:

- propping up one side of the outer cover by an inch with a stone or a piece of wood
- making one or two 1" cuts in the outer rim of the inner cover
- drilling a 1" hole in the top hive body, just above one of the handholds

Moist air can be captured within the hive by:

- a thick wad of cotton above the inner cover (this can be an old bath towel)
- a 5/8" piece of pressed board in place of the inner cover
- filling the area between the inner cover and the outer cover with a burlap bag partially filled with loose straw

I provide a means for the warm moist air to escape the hive. When considering how to prevent moisture within your hive; *do not be afraid of chilling your bees!* Cold does not kill bees; moisture will *always* kill them.

Producing comb honey with your bees will ensure that you become a real beekeeper, and will minimize your equipment investment while maximizing your monetary return. By becoming a real beekeeper, you will observe and learn much of the complex behavior that makes bees so fascinating and essential and, by proxy, will learn much about natures bounty in the area you live. BC

Lloyd Spear is a round comb honey producer living in up-state New York.

PLASTIC FOUNDATION

A Simple Side-by-Side Test

Bob Horr

The past few years, many suppliers have begun carrying different versions of plastic, injection molded foundation. There are three major manufacturers (Dadant & Sons, Inc – Plasticell Foundation; Mann Lake Supply, Ltd. – Rite-Cell Foundation and Pierco Inc. – Pierco Foundation) and they compete on the domestic and international market. I have received, in the last few years many calls and letters from beekeepers around the country wondering which foundation is better, how much better, and how do they compare to standard beeswax foundation.

To find out for ourselves, we decided to perform a little test and review these three foundations so if you plan to purchase any of these next Winter will be able to make a better, informed decision.

To perform this test objectively, we picked three average colonies from the same beeyard. It was the beginning of August, and there was a reasonable honey flow on. They were one queen colonies, headed by my Vigor Carniolan queens from the 98 season and all from the same mother. The average day time temperature was in the mid-70s. We've placed two different foundations in each colony between sealed brood combs (see Chart #1). We noted how each was drawn out every 24 hours for four days. We used regular 6-5/8" boxes and 6-1/4" frames for both brood chambers and honey supers.

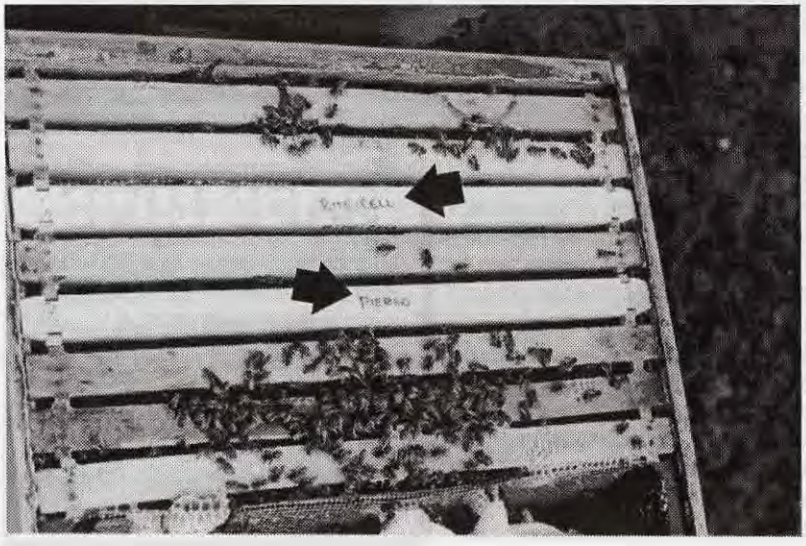
We also, before starting measured cell size of each, the overall size, wax coating quality, beeswax quality (by color and smell), weight, average retail price, availability and overall appearance.

To find out the acceptance of each type and any possible preference by our bees, we mixed types of foundations in each colony. There was only a little difference in acceptance after 24 hours. In the colony where Pierco and Rite-Cell foundations were placed, the bees drew out the Rite-Cell foundation a little faster. We also found eggs on about 1/3 of each side of the Rite-Cell foundation. After 48 hours there were eggs, honey and pollen in both.

In the colony with Pierco and Plasticell foundation the bees drew Plasticell foundation visibly faster than Pierco, and eggs were in the Plasticell 24 hours earlier than in Pierco foundation. About half of the Plasticell foundation had eggs on both sides. Forty-eight hours later, both had eggs.

In the colony with Rite-Cell and Plasticell foundation, the Plasticell was drawn out on the entire surface. However, Rite-Cell was drawn much better on those areas where a sufficient amount of beeswax had been placed. Some areas were not coated properly and bees avoided them during the first 24 hours. But after 48 hours these areas were drawn and honey, pollen and eggs were there.

After 96 hours all three colonies had drawn these foundations completely and had open brood and eggs,



Each foundation tested was placed in a brood box as pictured here.

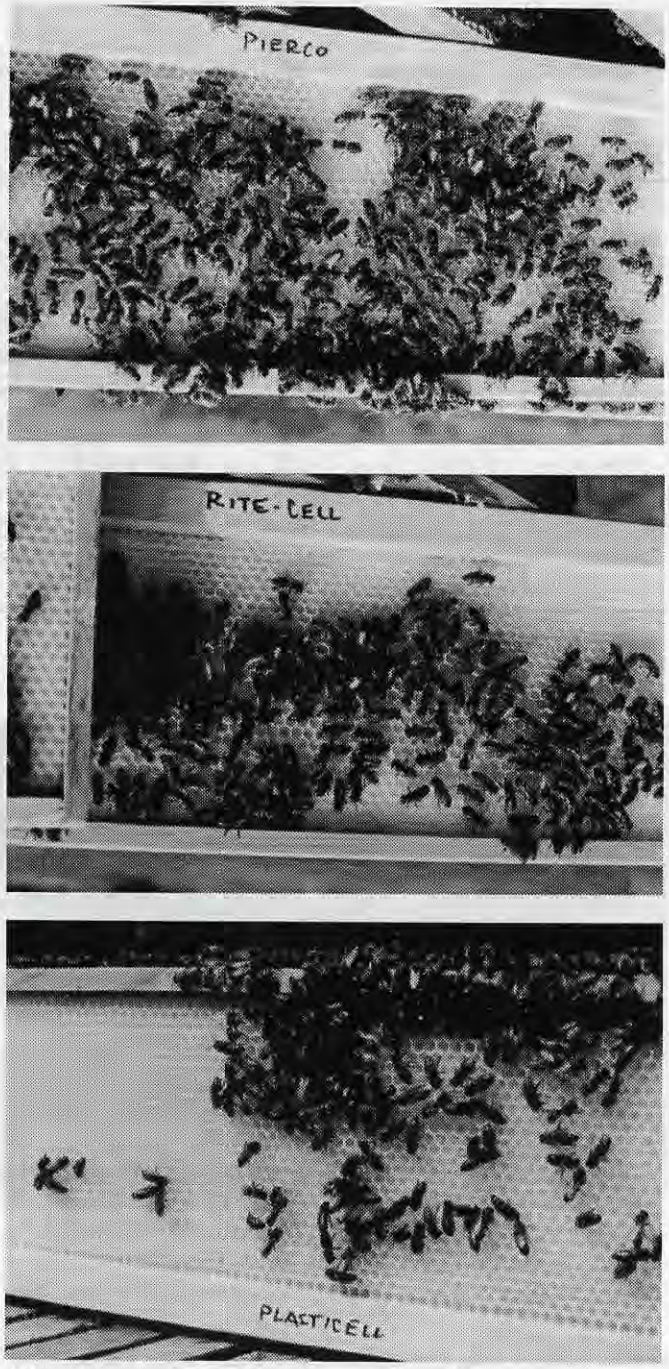
sealed honey and pollen.

Another common question is – what is better, plastic or traditional beeswax foundation? There are some disadvantages to beeswax foundation, in my opinion. First, installing beeswax foundation is labor extensive. It is prone to deformation and waving before installation. Another problem is that bees chew holes in the corners and they may draw drone cells.

A few years ago the Dadant Co. introduced "hybrid" foundation – Duragilt, which was a thin plastic sheet, covered with pure beeswax. The cells were embossed on the foundation roll machine and a metal edge was added. At the time this was revolutionary in our industry. Grooved top and bottom bar frames were used and the Duragilt foundation was fixed between the top and bottom bar. One disadvantage of Duragilt foundation is that bees sometimes chew wax away from plastic sheet and then produce drone cells or extra comb. When this occurs it is difficult to reuse. Even so, we have been using Duragilt in our operation for many years. For the past few years though, we are slowly switching to plastic molded foundation.

Plastic, injection molded foundations are a totally different story. They are much more durable and will last almost forever. Grooved top and bottom bars are used to install plastic foundations (the same as Duragilt). They are available from the manufacturers as beeswax coated or uncoated (I prefer the coated). They are easy to clean and they can be reused as many times as you wish. After selecting combs to be cleaned each Winter, we subject them to an overnight treatment of freezing. The wax then becomes brittle and a slight twist will crack and remove the wax. The rest of the un-popped cells are brushed away with medium soft shoe brush. Any cocoons left in the bottoms of cells are washed with water or if needed a power sprayer. This step can be avoided if you want the bees to clean the cocoons. We just try to make their life easier. After this, in the Spring or early Summer, the bees will redraw this foundation with no problem. Another advantage of plastic foundation is that they can be very easily disinfected. Just put them, after removing the wax in a 20-30% solution of NaOH (Lye) or other disinfectant. This will reduce risk of reinfestation with foulbrood, nosema or chalkbrood. After disinfecting, you have to wash the foundation in water a few times to remove the lye.

Summary As our tests show, there are only minor differences in these types of foundation. The biggest difference found was in the beeswax coating. Bees generally started to draw the best-coated areas, and later would move to the less coated or uncoated areas. The Dadant's Plasticell sheets we used had excellent wax coating and bees drew it out evenly from the start. The Rite-Cell foundation we used had some uncoated areas on the sides, but the center was well coated. From this



After 24 hours there was only very little difference in the three foundations.

CHART #1			
Colony #	**Foundation**	**Foundation Size**	**Frame Type**
1	Pierco & Rite-Cell	6-1/4"*	Wooden (grooved top & bottom)
2	Pierco & Plasticell	6-1/4"*	Wooden (grooved top & bottom)
3	Rite-Cell & Plasticell	6-1/4"*	Wooden (grooved top & bottom)

*We use only one size equipment (6-5/8" boxes w/6-1/4" frames) for brood and for honey.

Continued on Next Page

CHART #2

Foundation	Acceptance	Eggs after 24 hours	48 hours	72 hours	96 hours	Honey	Pollen	Time of Completion
Pierco	Yes	No	Yes	Yes	Yes	No*	No*	96
Rite-Cell	Yes	Yes	Yes	Yes	Yes	Yes*	Yes*	72
Plasticell	Yes	Yes	Yes	Yes	Yes	Yes*	Yes*	72 (or less)

*Honey and Pollen stored within first 24 hours.

CHART #3

Foundation	Cell size depth	Cell Size wall to wall	Foundation dimensions	Wax Coating quality	Wax quality	Average retail price	Weight	Availability	Overall Appearance
Pierco	0.0866"	0.1811"	16-7/8" x 5.5"	Poor (uneven coating)	Poor (dark wax)	$0.66	4.2 oz.	Various retailers	Good
Rite-Cell	0.0905"	0.1858"	16-3/4" x 5.5"	Good (some uncoated spots)	Excellent	$0.64	3.9 oz.	Mann Lake (& their dealers)	Excellent
Plasticell	0.0925"	0.1929"	16-7/8" x 5.5"	Excellent	Excellent	$0.89	3.1 oz.	Dadant (& their dealers)	Excellent

*Honey and Pollen stored within first 24 hours.

After 48 hours half of each side has eggs.

After 72 hours Rite-Cell is 90% drawn out, Pierco 75% drawn out.

test it seems that the foundation from both Pierco and Mann Lake Supply needed a bit more attention to the beeswax coating. Moreover, Pierco should attend more to the quality of beeswax used.

The price of Pierco and Rite-Cell foundations is almost the same. However, the higher price of Plasticell from Dadant is fully adequate to quality.

The weight of the foundation tested plays a role only because it may slightly increase the price of shipping. If you pick up your merchandise at the dealer's place of business this becomes less important. Any of these products will do a great job for you and if you still don't know which one to buy, try a few of each and make your decision then. BC

Bob Horr produces nucs, breeds carniolan queens and is a freelance writer from Lexington, NY.

THE GREAT ESCAPE

Separating honey bees from their honey can be a challenge, an opportunity, or a burden. Choose the right technique for your operation.

Roger Morse

If you have done everything the way it should have been done, and sometimes even when you haven't, there is honey to harvest in July and August. The problem is, that despite all that has been researched and written, there is no good way to harvest honey. It is backbreaking, sticky, messy and often stinging work.

Harvesting methods include, in the order I prefer them, bee escapes, bee repellents, bee blowers, smoking and brushing and bee cones. Bee cones are just another form of bee escape. Some beekeepers delay harvesting until the cooler days of October and November, when the temperature drops below about 57°F. This is the temperature at which the bees form a cluster and abandon the upper supers. That sounds great, but most honey starts to granulate by October, and there is no way to extract granulated honey. More important, the large, coarse granules that usually develop in honey have a bad effect on the taste appeal. Harvesting should not be delayed.

"Never, never, ever put a fume board in your trunk."

Stinky Mulligan

Bee Escapes

I never thought much of bee escapes until I began to work the odd day for Archie Coggshall, a 1,200-colony beekeeper in Ithaca, New York and son of William L., a one-time 4,000 colony fellow who 100 years ago owned more bees than anyone in the world. Archie had been exposed to every harvesting method known and was steadfast in using Porter bee escapes, which were invented in the 1890s.

The chief problem with bee escapes is that you must take two trips to the apiary. The second problem is that if you work alone, you must lift the supers off and put them back after you have put the bee escape in place. However, if you have burr and brace comb between your supers, and break it apart in the process of removing the supers, the bees will not leave while there is dripping honey present. This may mean three trips to the beeyard. On the first trip, you break the individual supers apart with a hive tool, lift one end up about three inches, and then let them drop back into place. The bees will clean up the mess made by breaking the burr comb apart in a day or two. On the second trip, you remove the supers one by one, put the bee escape in place, and then put the supers back and above the escape. Twenty-four to 48 hours later, the bees should have left the supers and they may be picked off.

During cooler weather, it may take a day or two more for the supers to be cleared of bees. This is a tricky area to write about. In very cold weather, the bees will rush down to join the cluster, but in cool weather that hovers just above the clustering temperature, bees move more slowly. Bees form a Fall and/or Winter cluster when the temperature falls below 57°F, but how soon the temperature falls to that level in the hive also depends on how many bees are present in the hive.

Bee escapes work best if the hives are more or less level. This is an important point and deserves more attention.

Archie Coggshall did it differently. He went to the beeyard with three men, himself included. Two men lifted all the supers on a hive up and to one side at one time while the third man pulled off the queen excluder and put the bee escape into place. This meant there was no dripping honey as the upper supers, which could be two, three or four in number, were not broken apart. Yes, Archie insisted on using a queen excluder, and I like them, too, but that is another story. If there is brood above the bee escape, many of the bees will not leave the super.

The honey was harvested two days later, starting at about 4 a.m. We carried small balls of cotton with us, and after the bee escapes were in place we walked around the apiary plugging small holes and/or cracks in the

Three men needed – two to lift and one to put in the escape board.

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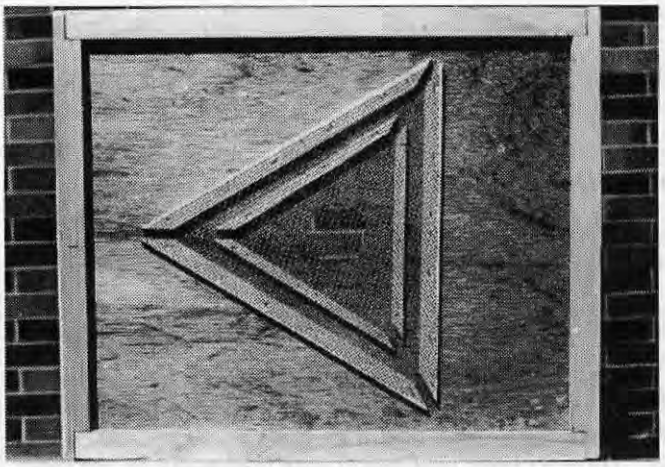
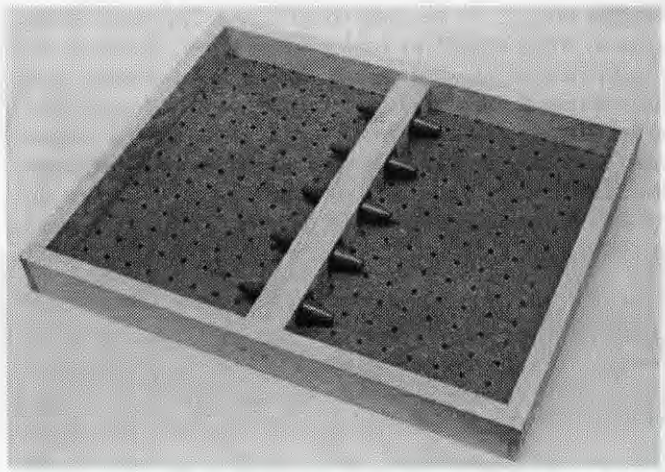
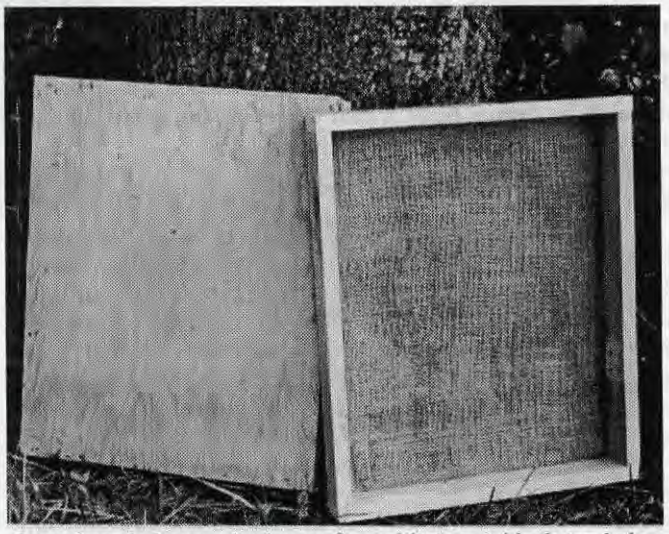




Besides the familiar Porter escape, the maze board (top) and the cone board are sometimes used.

A fume board has the same outside dimensions as a super.



Some boards have a burlap or flannel lining. A black top helps absorb heat and makes the fumigant work faster.

supers with it. Robbing of the honey in the supers will certainly take place if any holes where a bee may enter are left. At four in the morning we wore hip boots because the grass was wet. However, we did not use veils since no bees were flying. It was hard work lifting the full supers of honey, but it went fast.

There was once a 400-colony beekeeper in northern New York who used eight-frame equipment. He did not use excluders. He told me the best way to put escapes into place was to break the supers apart at the point you wanted to put the bee escape and to push the escape board into place about five inches. The next step was to bear-hug the supers and to push the escape into place with your tummy. This man was a full-time, lifetime beekeeper. I'd like to see a letter to the editor from someone who uses this technique. I've never tried it. How well does it work? This beekeeper told me he put the escapes in place before 9 a.m. on a sunny day and harvested the honey before 10 a.m. the next day, by which time no robbing had started even if there were holes in the equipment. The times listed in the last sentence are critical if you are to prevent robbing, especially as Fall approaches.

Repellents

I grew up using carbolic acid as a bee repellent to remove supers of honey from colonies. That chemical has been removed from the market by the Environmental Protection Agency and probably with good reason, as it was dangerous to use. However, the fact is that I like repellents, chiefly, I think, because their use requires only one trip to the beeyard.

Three repellents are on the market today: benzaldehyde and perfumed and plain butyric anhydride. No one of these works as well as carbolic acid. This is an area that needs more research. Butyric anhydride is a good bee repellent but, to use plain words, it has a hor-

Be sure to add enough, but too much will drive bees completely out of the colony. Follow label instructions.

Blowing bees is fast, efficient and generally chaotic. Leaf blowers can be easily adapted for this use, are light and easy to handle.

rible odor. The perfumed stuff is better, but still has an odor. Benzaldehyde works well if the temperature is not too hot (the bees become confused easily when the temperature is above 90°F), and the stuff has little or no effect when the temperature falls below about 70°F.

Bee Blowers

Blowing bees off combs while they are still in place in supers is a favorite method of harvesting honey with many commercial beekeepers. I think it is as fast as is using repellents, but I've never watched a race between the two methods. I've used bee blowers enough to know I like this method of harvesting supers, but I still prefer bee escapes. If find it fascinating that bee blowers do not make bees angry the way smoking and brushing does and I've never heard any good explanation as to why that is true. Still, it is best to wear a good bee suit when blowing bees as there are crawling and confused bees everywhere in the beeyard after the first few supers have been removed.

Smoking and Brushing

If you use an excessive amount of smoke, it is possible to remove the combs one at a time from one or two supers of honey and to brush the bees off and onto the ground in front of the hive. A bouquet of about ten goldenrod tops makes a good, one-time bee brush. About the time you start on a third super you have riled the bees sufficiently that they begin to sting like fury, and it is time to quit. But, if you have only one hive, or want to harvest only one or two supers a day, it is a good technique. It is best to do this in the late afternoon so that the bees will calm down overnight. Use this method only when the bees are flying so as to reduce the number of stinging bees in the hive. (Old bees are far more aggressive than are young bees.) If you want to harvest more than two supers using this technique, you may do so by wearing two or three pairs of pants, two shirts, boots, a wire veil in good working order and gloves. I recommend the method for removing one or two supers from a hive, but remember not to dilly-dally, and keep the smoker hot.

Hive Cones

One bee supply company advertises a bee escape using small cones. The bees exit by entering the large end of the cone and escape from the small end that is about three-eighths of an inch across. I've never used this type of escape board, but it should work quite well. I've used cones to take bees out of other places such as hollow trees and the sides of buildings, and they work very well.

No matter which technique you use, remember that honey is food, and keeping things 'clean' is paramount. Remember, too, that if you live in an area infested by our newest pest,t he Small Hive Beetle, delaying extraction could pose problems.

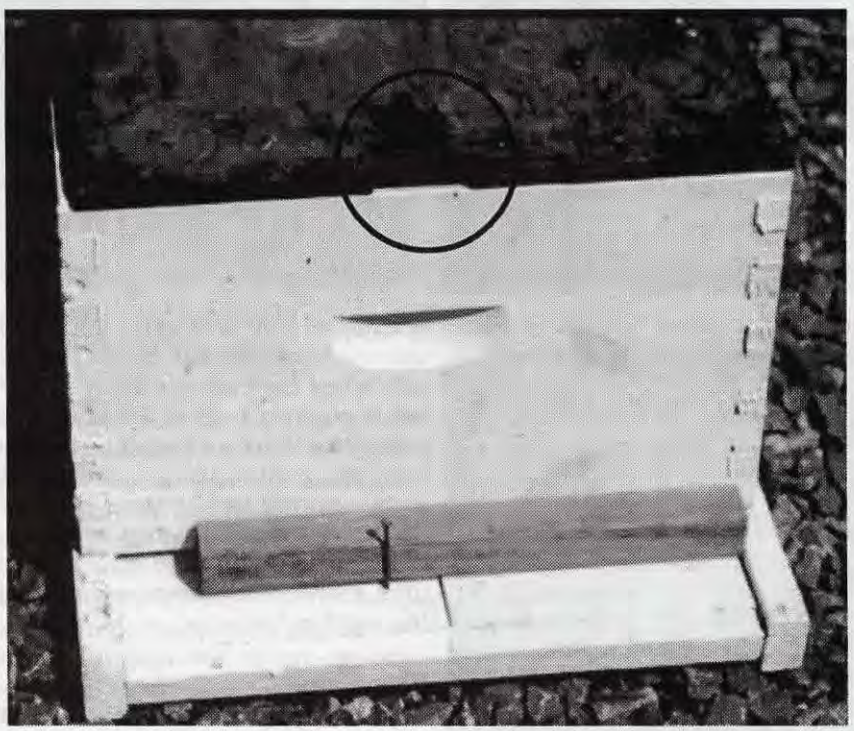
Robbing bees, removing supers, honey harvesting – no matter what you call it, and no matter how you do it, is the reward for a successful season. Enjoy!BC

HOME MADE

You can make entrance reducers, inner covers and hivestands a lot cheaper than what you can buy them for.

Rick Green

I have 100 hives, and if the mites and beetles don't discourage me, I will continue to grow. Usually, I don't cut corners. I buy only unassembled deep hive bodies and have standardized on plastic frames. Everything else, I figure can be made. I have found a way to make my own entrance reducers and inner covers from treated materials. They cost less, last longer, and have only one minor drawback.



Entrance Reducers

Treated 2x2's eight feet long cost $2.40. Cut them into 12-inch lengths, and (optional) rip these in two. This makes eight (16) reducers for 30 (15) cents apiece. I slide them either to the left or to the right and thereby create one opening on either side instead of the classic opening in the middle, which requires many more saw cuts to make. A nail holds it in place. Incidentally, the bees have adapted nicely to this change!

Inner Covers

Buy 4x8 sheets of treated half-inch plywood. By cutting carefully, you can make 11 inner covers. Place a large notch on either narrow side to allow the bees an upper entrance when the outer cover has been tilted back. I have found only one little problem with these covers in two years of use. The bee space is violated, and some hives will fasten it securely to the frames below. With a sideways twist, the seals are easily broken. Leave the wax and propolis on the underneath side. By not scraping the wax off, the bees won't be tempted to seal it again. Not every hive puts wax beneath these inner covers, only the strongest. This has become an indicator to me of the strength of the hive. The plywood in my area costs $17.25 a sheet; divided by 11 inner covers yields a price of $1.57 each.

Bottomboards

I am still experimenting with bottomboards and outer covers. Do you have any ideas? I set everything on two cement blocks which can be found for 25 cents apiece, or less if you pick them up yourself. And by orienting the blocks in an east-west direction with the hive facing south, straps can be easily placed around the hive by one person without disturbing it, making it ready for moving when the need arises, such as for pollination contracts.

Cost Savings Per Hive

Purchase prices were extracted from various 1999 bee supplier catalogs.

	Purchase Price	Make	Savings
a. Entrance Reducers	$1.00	.15	.85
b. Inner Covers	7.95	1.57	6.38
c. Hive Stand	8.00	.50	7.50
Total Savings (per hive)			**$14.73**

Rick Green makes equipment, sells honey and writes about bees from his home in Ballston Lake, NY.

Langstroth ~ Philadelphia Beekeeper

E. F. Phillips

On October 20, 1951, at The Morris Arboretum of the University of Pennsylvania, near Philadelphia, the Langstroth Memorial Bench was dedicated. The bench was situated in the Langstroth Bee Garden in the Arboretum, created that year, the Centennial year of Langstroth's discovery of bee space and the creation of the Removable Frame.

On July 10, 1999, a rededication of the Langstroth Bench, rebuilt exactly as before will occur. As before, members of the Arboretum, the Montgomery County Beekeepers' Association and the Pennsylvania State Beekeepers' Association will be present and assist in the dedication.

Below is the address by E.F. Phillips delivered at the original dedication nearly 50 years ago. It reviews the life of Langstroth, and is a fitting reminder of our indebtedness to his vision.

It is eminently appropriate that the celebration of a discovery made by Lorenzo Lorraine Langstroth should take place in the Philadelphia area, on a date close to that of the actual discovery. Langstroth was a Philadelphian and his name should be perpetuated here more than any other place.

He was born in 1810 as a Christmas gift to a loving family as well as to an important part of humanity in need of his benefaction. His birthplace was 106 South Front Street, which he described as "not far from Independence Hall."

His grandfather, Thomas Langstroth, had come from West Riding, in the parish of Horton, Ribblesdale, England. Near here the River Wharfe rises in a mountain valley which still bears the name of Langstrothdale. At twenty-two, in 1767, Thomas Langstroth came to America on business, decided to remain in this country, and never returned to his homeland. Here he married Ann Youck, whose parents had come from Prussia and settled in Germantown. They had twelve children, of whom eight lived.

The fourth son, John George Langstroth, Lorenzo's father, married Rebecca Amelia Dunn, the daughter of an English family which had settled on the Eastern Shore of Maryland. Her mother traced her ancestry to the Lorraines, Hugenots of nobility, who had fled from France after the revocation of the Edict of Nantes. Thus our Lorenzo Lorraine Langstroth traced his origins to England, Germany, and France.

He was the second of eight children and the oldest son. As a child he developed an unusual interest in the habits of insects, and he recorded in his reminiscences that he was "whipped" as a young boy for wearing out the knees of his trousers "by too much kneeling on the gravel walks" in his eagerness to "learn all he could about ant life." Langstroth also tells of his observations of the habits of the cicada, which he began watching in Center Square (now City Hall Square) at the tender age of eight, and continued to observe each season of their emergence until he was twelve. Forty years later when he returned to Philadelphia, it was again a locust year, and he collected large numbers of pupae (which he called larvae) from trees in Independence Square. These he showed to his daughter, and she and some of her companions sat up until after midnight with him watching the curious changes as the pupae became adult cicadas. The childhood interest of Lorenzo in insect life is significant as a kind of prophecy of his later keen observations of bee-life.

The neighborhood in which young Langstroth grew up was at that time a choice residential section, but it is now changed beyond recognition. Today it teems with commercial activity.

Langstroth attended the preparatory school conducted by the University of Pennsylvania and studied the usual required subjects of that day, which would probably be regarded as of little practical value by the parents of today's children. The demands for college entrance, then as now, were severe; but in those days they included, besides Latin and a modern foreign language, Greek and a heavy schedule of mathematics. None of the interesting new fields of study which today are required were included, nor even recognized.

At seventeen, Langstroth entered Yale College, where his curriculum may be described as "more of same." Again he studied the classical languages, including Hebrew, more modern languages, advanced mathematics, logic, some history, and abundant rhetoric. The only course in the curriculum which even faintly suggests the biological sciences was one in "Paley's Natural Theology, or evidence of the Existence and Attributes of Deity." The modern biologist would scarcely consider this an adequate training for work on the behaviour of an insect. Nevertheless, this was Langstroth's preparation for his scientific contribution to beekeeping. In favor of the stiff curriculum, it may be said that anyone who could survive all those courses at least learned to use his mind.

During Langstroth's senior year at Yale, the course of his future life was determined by the arrival of a new student, Peter Parker, who became his good friend. Parker had transferred from Amherst to Yale for the

senior year, and it soon became apparent that he was deeply religious and desired to convert his classmates. Langstroth had not up until this time been concerned with religion; but after long discussions with Parker, he was the first man in his class to be stirred by the latter's preaching. Before the year was out, a number of the class had followed Langstroth's example and given up worldly things. The movement was sufficiently profound to be known later in Yale circles as "The Revival of 1831."

Nowhere in his writings does Langstroth indicate whether he had a plan for his future before his interest in religion became so intense; but now he decided to give his life to the Christian ministry. Therefore, after his graduation in 1831 he entered Yale's Theological Seminary, even though he knew that his father would not be able to help him financially because of recent business reverses. In his reminiscences he says, "I felt strongly persuaded that if, with a college course, I had not sufficient energy to finish my theological studies from my own earnings, I gave but poor evidence of having any call to preach the gospel."

To support himself, Langstroth now took up teaching, giving courses in schools for young ladies in New Haven; and for at least one year he held a full-time teaching position in a village across the Hudson from West Point. In his fourth year after graduation, Langstroth was made a tutor in mathematics at Yale, and at the same time came an opportunity to engage in the work to which he dedicated his life.

During Christmas vacation, he supplied the vacant pulpit of South Church, Andover, Massachusetts. He made such a favorable impression on the congregation of South Church that he was asked to become its pastor on January 7, 1836. The three-year period of his pastorate at Andover in many ways was a happy interlude, although it was attended with certain difficulties. He had become increasingly subject to severe headaches accompanied by indications of melancholia. Also his mother and sister became dependent upon him, just at the time of his marriage to Anna Tucker, a daughter of the head of one of the schools in which he had taught in New Haven.

Langstroth came to know Anna Tucker through their mutual interest in mathematics while she was an assistant in her mother's school. Their marriage was an extremely happy one. Unquestionably, he owed much to her devotion, which never flagged during his periods of financial difficulties. To quote again from his reminiscences, he says, "When I began housekeeping in the spring of 1837, the inflation of prices in the time of President Van Buren had culminated. I paid $15 for my first barrel of flour; and although my salary was considered a good one, it soon became quite apparent that my expenses would exceed my income. My dear wife, instead of even intimating that it was hard for us to begin the world with expenses much greater than would suffice for a considerable family, always encouraged me in doing my duty for the relief of the dear ones whom God had made dependent upon us, saying that we might thus safely trust events to our Heavenly Father."

It soon became evident that Langstroth's health would not permit him to continue his pastorate, and at the end of three years he was forced to resign. In the spring of 1840 he accepted an invitation to become principal of the Greenfield, Massachusetts, High School for Young Ladies, and moved his family to that city. While acting as principal, he supplied the pulpit of the Second Congregational Church for nearly two years, and then became its pastor.

In 1838, during his residence in Andover, a seemingly trifling event started the chain of happenings that led to Langstroth's interest from that time on in studying the life of the bee and perfecting the art and science of beekeeping. Calling on one of his parishioners, Langstroth noticed on the table a large glass globe filled with beautiful comb honey. His comments on this resulted in a visit to the parishioner's attic apiary. "In a moment," Langstroth remembered, "the enthusiasm of my boyish days seemed, like a pent-up fire, to burst out in full flame. Before I went home I bought two stocks of bees in common box hives, and thus my apiarian career began." Langstroth does not tell us the name of the that beekeeper, which is a pity, for his name should certainly be gratefully remembered since he was responsible for arousing Langstroth's latent scientific interest.

Almost the first thing Langstroth did after moving to Greenfield was to buy a stock of bees in a hollow log. Avidly he studied the few books on beekeeping available at the time, and soon became the happy owner of an improved Huber hive, and several bar hives made according to Bevan, author of Bevan's *Treatise on the Honey Bee*, published in London in 1838. Constantly he experimented in trying to make a practical hive for the common beekeeper out of the huber hive, but got no worthwhile results. He recalled that the only improvement he was thus far able to make was to give the hives greater protection against extremes of heat and cold.

As all beemen know, the first thing one beekeeper does in a new locality is hunt up people with the same

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LANGSTROTH ... Cont. From Pg. 49

passionate interest in this insect, and Langstroth was no exception. In the neighboring town of Colrain he found William W. Cary, who had some hives, and after meeting him a deep and lasting friendship sprang up between the two men. This friend was the first of the Carys to keep bees, but ever since members of the family have kept up their interest.

The Second Congregational Church of Greenfield is next door to what was known for years as the "Hollister House," a fine example of late colonial architecture in which Langstroth conducted his High School for Young Ladies. In the church yard may be seen today a beautiful bronze plaque placed there in recognition of Langstroth's contribution to beekeeping. The old New England meeting house in which he preached has been replaced by a more modern, and doubtless more efficient, building; but to many it is far less beautiful than the original white-spired house of worship.

During Langstroth's pastorate at Greenfield, he suffered greatly from frequent attacks of his head trouble, which at last compelled him to resign his charge. Now he decided to return to the home of his boyhood and open a school for the education of young ladies there. He settled his family of three small children, one boy and two girls, in a house located at the corner of Chestnut and Schuylkill Seventh streets, as it was designated in the old system naming streets in Philadelphia. Here in the fall of 1848 he opened his school. Today we know the location as Sixteenth and Chestnut streets.

The house had a second-story porch, or piazza, and a number of attic rooms, and these Langstroth used for the apiary he soon established for experimentation. In the rear of the lot was the customary stable where he kept his driving horse and carriage. It is difficult to visualize this corner of Sixteenth and Chestnut as an area of homes and gardens with stables in the rear, and open countryside not far away where bees could forage, for Chestnut street has been for many years Philadelphia's chief commercial thoroughfare, thronged with shoppers. It ranks today as one of the most celebrated streets in America, and virtually all signs of family dwellings have given way to shops and business offices.

At the time of establishing his Philadelphia apiary, Langstroth had studied every known type of hive, and was far ahead of beekeepers of his generation in appreciating the necessity for a taller hive then in common use, yet one which was compact in form to serve as living quarters for the bees except during the period of crop storage. He therefore placed one hivebody on top of another.

Through his intense study of the literature on beekeeping, he learned of the work of the Swiss scientist Huber, who had succeeded in having bees build their comb in frames which were hinged so they might be separated like the leaves of a book. Moses Quinby, the other great beekeeper of Langstroth's time, used a hive of this same general type, but Lasngstroth found it of little more practical value than ordinary box hives. He next experimented with hives used by the English beekeeper Bevan, and certain French and German scientists. These had the combs built down from bars which rested on the top edge of an open box. This plan presented the difficulty that the bees built the combs so securely to the sides of the box that their removal was a soul-trying operation. Langstroth found further trouble when he put on a second story, for the bees then glued the upper body tightly to the bars of the lower hive. Unless the separation was made by very careful cutting, the combs would be wrecked, and only honey in perfect comb was salable to the public of that day.

This was where he stood in his investigations early in the spring of 1851 when he removed his apiary from his home some two miles. Working with the bar hives, Langstroth conceived the idea that if he lowered the tops of the bars a little, leaving a small space between them and the bottom of the upper box, that when it came time to cut the boxes apart, his knife would not encounter the wood of the bars and thus the task of separating the two hive-bodies would be easier. When he did this, he discovered that the bees did not fill any part of this space with their "glue" (propolis). This 3/8 inch passage is now known as a beespace, a corridor just high enough for the passage of a bee, and one that the bees leave open for access to other parts of the hive.

It seems strange that this discovery did not at once suggest to Langstroth the idea of giving the same space on all sides of the combs hanging from the bars by means of uprights fastened to them, thus changing the bars into movable frames; but it did not so occur to him and he used the convenient narrow space above the bars for a whole season without thinking of extending his idea further.

In his reminiscences, Langstroth reports:

"Returning late in the afternoon from the apiary, which I had established some two miles from my city home, and pondering, as I had so often done before, how I could get rid of the disagreeable necessity of cutting attachments of the combs of the walls of the hive, and rejecting, for obvious reasons, the plan of uprights, close-fitting (or nearly so) to these walls, the almost self-evident idea of using the same bee space as in the shallow chamber came into my mind, and in a moment the suspended movable frames, kept at a suitable distance from each other and the case containing them, came into being. Seeing by intuition, as it were, the end from the beginning, I could scarcely refrain from shouting out my 'Eureka!' in the open streets. At the same time there was visiting me my college classmate, the late Rev. E. D. Sanders, who afterward founded the Presbyterian Hospital in Philadelphia, and who had taken that season a lively interest in my apicultural experiments. Full of enthusiasm, we discussed, until a late hour, the results which both of us thought must come from using movable frames instead of bars. Before I sought my bed, under the date of October 30, 1852, I made this record in a private journal still in my possession: 'If the slats are made so that a and b (that is, the uprights), are about 3/8 inch from the sides of the hive, the whole comb may be taken out without being at all disturbed by cutting... By the very great ease with which the bars with their combs may be removed, a command over the whole proceedings of bees is obtained which is truly wonderful... The removal of the

Continued on Page 59

INNER ... Cont. From Pg.

Tom Sanford, in his article on the Digital Age, talks about the apparent chaos in a beehive – a condition most of us can relate to.

As near as I can tell most bees don't read the books or magazine articles written about how they should behave. Nor do they watch the videos, attend the classes or have anything to do with that guy's bees down the road who it seems must be reading and studying and playing by the rules.

The argument on the other side of this discussion, of course, is the bees know full well what's going on and are reacting to the environment as they see it. That what they do resembles not in the least what we think they should do concerns them not a whit. Predicting, planning and preventing bee behavior is our problem, not theirs.

Let me give you some home grown examples.

One of four of my colonies made it through the Winter. One starved, one died, most likely, from tracheal mites, and one just died. The one remaining had about two cups of bees, a queen and about three square inches of brood in late April, when I finally got to it.

This one's history, I thought, but I don't need the equipment right now, so let's see what happens. Two weeks later a cup and a half of bees, two or three supercedure cells, and even less brood. They'd missed the early flow, were declining at a somewhat predictable rate (maybe they read a chapter or two), and I waited to see. End of May, a few cups of bees, a frame or so of brood, and over a dozen supercedure cells.

By early June, a few more bees, less brood and nearly 30 supercedure cells. You probably know what happened, that's the easy part. But why?

Another one. A two-pound package destined for an observation hive arrived in good shape and was installed in a nuc and left alone. A week later the queen is out, laying, and all looks well. Another week and the observation hive is set up. One small problem. One of the frames in the deep nuc was a shallow. They drew out the bottom and there were eggs in the new comb. The bees were transferred mid-day, so there were foragers out (I know, I know, but it was the only time to make it work).

That night, a half cup of bees was huddled on that new comb. You know what happened. Supercedure cells, queen emerged, mated and by early June frames of brood, more eggs and lots of bees. I think they may even make some honey this year.

Neither of these events is unique. Both are easily explained – in hindsight. But could you have predicted the outcome of either, managed either for maximum production? What I'm getting at here is that the books and articles and classes tend toward the best management practices, when bees behave the way we think they're supposed to. So when yours don't, when no matter what you do they don't react like the book says, don't get too discouraged, don't give up, don't always fault yourself or the experts. Sometimes the bees just do what they think is right. Learn from it and move on.

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Dewey Caron got his B.A. in Vermont, his M.S. in Tennessee and his Ph.D. at Cornell, with Roger Morse. In 1969, while still a graduate student at Cornell he gave his first talk at an EAS conference. From '69 to '80 he taught at the University of Maryland, attending most and speaking at several EAS meetings. While at Maryland he taught beekeeping, researched bee biology and for awhile was in charge of the state's inspection program. He also held the Extension position in beekeeping, and did some work in urban entomology.

While at Maryland he spent a nine-month sabbatical at the USDA Bee Lab in Tucson, and worked closely with the scientists at the Beltsville Bee Lab. Jim Tew and Elton Herbert were graduate students there at the time also.

In 1981 the University of Delaware made him an offer he couldn't refuse, and he moved there to become Chairman of the Entomology Department. A year later he led a delegation to Panama, and first encountered the African Honey Bee.

Many, many trips to Panama, Costa Rica, Belize, Brazil, Trinidad and Mexico led to two important events – a Kellogg International Fellow award, and the chance to meet his wife Nieves, another Fellow from Bolivia.

Back in Delaware Nieves finished her degree and Dewey is still teaching and working in Panama and Costa Rica. His work in Panama produced an American Express Award For Excellence through partners of the Americas.

All this time his EAS commitment continued, as president in 1986 and teaching the Short Course and working the Master Beekeepers program.

In 1986 he was appointed Assistant Chairman of the Board of EAS, and was elected Chairman in 1990. His tenure as Chair brought about two publications – one on Good Neighbor Policy and one on Pollination. He was instrumental in starting the EAS Research Fund and has promoted it aggressively since its inception.

Dewey is retiring as EAS Chair this month. He has to since a Chairman can only serve two terms. He says he will continue teaching, doing Extension work in beekeeping and urban entomology, travelling and teaching in Panama and Costa Rica, and, as he says remain a consultant and 'Elder Statesman' for EAS.

This industry, hundreds of students and several countries have benefited from his work, and will continue to gain from his teaching and his experience. And for 30 years EAS has had the pleasure of the company and the leadership of a really great guy. Thanks Dewey.

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So, give an editor a hand, keep your hive tool sharp and your smoker lit and remember that the bees almost always know what's best. Almost.

Races

CAUCASIANS

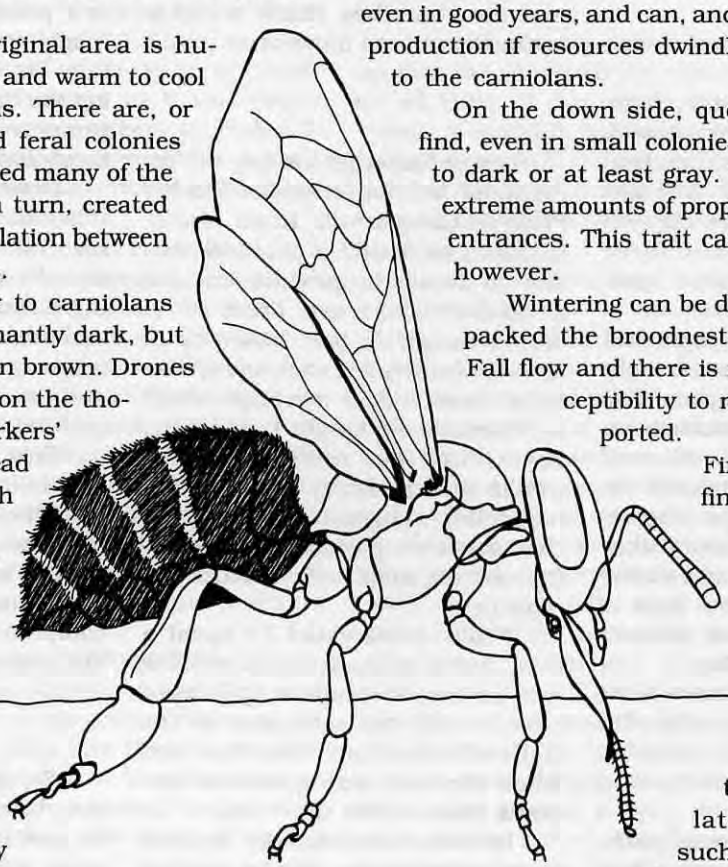
The Grey Mountain Bee

Kim Flottum

Caucasian honey bees originated in the general area of the Caucasus Mountains and the Black Sea. Officially, *Apis mellifera caucasica* Gorbacher, the 'Grey Caucasian Mountain Bee,' is used worldwide as a productive and useful race.

The climate of their original area is humid-subtropical at sea level and warm to cool temperate in the mountains. There are, or were abundant forests and feral colonies were plentiful, which provided many of the drones in the area. This, in turn, created a more or less uniform population between feral and managed colonies.

Caucasians are similar to carniolans in size and shape, predominantly dark, but with some yellow rather than brown. Drones have a dense hair covering on the thorax that is deep black. Workers' hair covering tends toward lead gray rather than brownish gray.



Most famous however is the length of the proboscis, or tongue. Famed for years for this attribute, caucasians were used to take advantage of some of the clover varieties with corollas too deep for Italians. Or so the history was written.

As far as a race of bees to keep, Caucasians have some outstanding attributes. Reportedly they are one of the gentlest bees one can own. Very quiet on the comb, few bees in the air when working a colony and not inclined to defend their colony more than three to five feet away.

They have less tendency to swarm than most races, primarily because they build fairly slow in the Spring. They are resource respondent, and excel in areas where the nectar flow is long and slow, rather than short and intense. They generally do not develop huge populations even in good years, and can, and will slow or cease brood production if resources dwindle or fail. This is similar to the carniolans.

On the down side, queens can be difficult to find, even in small colonies because they, too tend to dark or at least gray. The race generally uses extreme amounts of propolis, especially at colony entrances. This trait can be used by collectors, however.

Wintering can be difficult, especially if they packed the broodnest with honey during the Fall flow and there is no room for brood. Susceptibility to nosema is commonly reported.

Finally, they are difficult to find if purchasing them is in mind. Only two companies in the U.S. advertise them.

Caucasians, if found, do well in areas where Spring is often late, wet and cold. And, or, if the beekeeper is running late. Managed correctly, such that stores are properly placed in the hive, medicated and in an area where early Spring, or late Fall flows are more even, and Summer flows are steady but not intense, this bee will thrive.

Information for this article came from the book *Biogeography and Taxonomy of Honeybees*, by Fredrich Ruttner and *Honey Bee Pests, Predators and Diseases*, edited by Morse and Flottum.BC

Questions?

No Bees On Vitex

I planted Vitex seed a few years ago and they bloomed this year. Only bumble bees and solitary bees visited them, however; no honey bees. Is this not supposed to be a good bee plant?

George Conner
Hutchinson, KS

Vitex is supposed to be an excellent honey plant. Sometimes good honey plants fail to attract bees because of special soil conditions, and that is the only thing I can think of to account for yours.

Editor's Note: *There are, however, several species of Vitex. Some are attractive to honey bees while others, primarily due to their flowers' shape and size, are not.*

Handling Sickness

I am about to offer my honey for sale. Have there ever been consumer complaints about honey making them sick? If so, how would one handle that?

Maureen Schweiker
New Gretna, NJ

It is exceedingly rare for honey to cause any kind of illness. In the only cases I know of, when people became ill, they had apparently gorged themselves on Rhododendron honey. I think this is not a problem at all, and you can, in any case, try the honey yourself before selling which you would doubtless do anyway.

Apistan - Now or Fall?

I have two hives started this Spring with package bees, and plan to start a third with brood from these two plus a new queen. Should I treat these colonies with Apistan now, or wait until Fall? One of the colonies is much more busy than the other. Does that mean that one may already be weakened by *Varroa*? Or is there another explanation?

Ed Kapraly
Delaware, OH

I think you can assume that colonies just started from packages are free of *Varroa* now, but you should by all means use the strips in August. As for the apparent difference in the strength of these two colonies, that would not be due to *Varroa*. Check the brood patterns in each hive. The weaker one might have gone queenless. Make sure there are eggs or very young brood in a good pattern.

Can They Hear?

Are bees deaf? Can a swarm be brought down from a tree by beating on pans, as some of the older books say?

Charles F. Byram
Oak Ridge, TN

Bees have no ears, but can sense vibrations by the antennae and legs, and this is a form of communication inside the hive. The behavior of a clustered swarm is not affected by the sounds of beating on pans. It used to be thought that a swarm in the air could thus be caused to cluster, but of course the bees were going to cluster anyway, with or without the beatings on the pans.

Trapping!

When trapping a colony of bees from a structure using a little screen funnel, my agricultural extension pamphlet says that it is possible to use a hive with just foundation and one frame of brood, and that in time the queen herself will emerge from the structure and enter the hive. Do you think that would work? Or is it necessary to use a small queenright colony?

Mitchell Drinnon
Sneedville, TN

I don't think that would work at all. I might be proved wrong, as I so often am, but I don't think any power of heaven or earth would induce the queen to leave the parent colony and go into the other one, so long as there is any brood or a significant number of bees still in the parent colony; and there is sure to be brood as long as the queen goes on laying, and sure to be bees as long as that diminishing amount of brood keeps hatching. Why not just have a queen, or queen cell, in the colony you are trapping the bees into?

No Feral - No Drones?

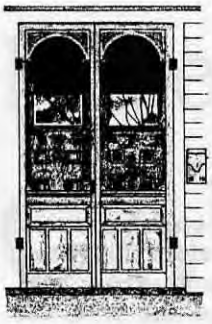
Does the virtual disappearance of feral colonies due to parasitic mites mean that there will be no drones to mate with the queens some beekeepers will be trying to raise?

Name Withheld

It seems unlikely that no drones will be available. Other beekeepers and some feral colonies will be in the area. However, there will certainly be fewer drones than in the past (before mites) and if a queen producer does not supply additional drones there may be mating problems. Another problem is that the drones that are available are of unknown origin and quality. A queen producer would most assuredly want to supply drones with those qualities that best fit the locale.

Answers!

Richard Taylor



Ann Harman

Home Harmony

Tennessee Delights!

This July, the members of the Eastern Apicultural Society will be visiting Tennessee to participate in "Beekeeping With a Southern Touch." One nice thing about visiting different parts of the country is the chance to sample foods characteristic of that area. So this month we will change the above theme just a little to "Foods With a Southern Touch."

From looking at the recipes from Tennessee, it is apparent that the beekeepers there really enjoy using Tennessee honey. If you have a chance to purchase some Tennessee honey at the EAS conference then you will be all set to try out these recipes. However, not everyone can come to this year's conference, so I think it will be OK to use your favorite honey.

CAJUN HOT TOMATO BREAD

This recipe is a yeast bread with a difference. This bread would make a wonderful gift loaf, so don't lose the recipe. You may wish to make some loaves at Christmas time to give to those people who seem to have everything.

1 cup Bloody Mary mix
1 cup water
1 package yeast
1/3 cup honey
1/4 cup vegetable oil
1/4 cup chopped green onion tops or chives
1/4 cup chopped parsley
1 clove garlic, pressed
1 teaspoon salt
5 – 6 cups all-purpose flour

Combine Bloody Mary mix and water in small saucepan. Cook over low heat until mixture reaches 105-110°. Pour into large, warm bowl. Add yeast and stir until dissolved. Add honey, oil, onion tops, parsley, garlic and salt. Mix well. Add 1 cup flour and stir until smooth. Stir in more flour until firm dough is formed. Knead dough on lightly floured board about 5 minutes or until smooth and elastic. Shape dough into a ball. Place in greased large bowl; turn to grease all sides. Cover bowl and set in warm place to rise, about 1 hour or until doubled. Punch dough down and divide into two equal pieces. Shape into loaves and place in greased 9x5x3-inch loaf pans. Cover and set in warm place to rise, about 1 hour or until doubled. Bake in preheated 400° oven about 30 minutes or until loaves sound hollow when tapped and the crusts are brown. Remove from pans and cool on wire racks.

From Marlene Thomas, Kingston, TN

APPLE CRISP

Tennessee has had Honey Queens who have prepared recipe leaflets to hand out when promoting Tennessee honey. You will see from the next series of recipes that they did a great job of encouraging the use of honey. Their recipe leaflets also give information on honey, substituting honey for sugar, and care of honey.

Peel and slice enough apples (8-12 medium) to fill a greased 9x13-inch baking dish. Mix apples in bowl with:
3 tablespoons lemon juice
1/2 teaspoon cinnamon
3/4 cup chopped dates (can use part raisins)
2 tablespoons whole wheat flour

Return this mixture to baking dish and add just enough water to barely cover bottom of dish.

Topping:
3 cups quick oats
2/3 cup wheat germ
2/3 cup whole wheat flour
1 teaspoon salt
2 teaspoons cinnamon
2/3 cup ground sunflower seeds (use part chopped walnuts)
1 cup honey
3/4 cup oil

Mix topping in bowl and then press onto top of apples. Bake until apples are soft, approximately 25 minutes at 375°. Do not let get too brown. Serve topped with whipped cream.

BEETS IN HONEY SAUCE

1 tablespoon cornstarch
1/2 teaspoon salt
1 tablespoon water or beet juice
2 tablespoons vinegar
1/4 cup honey
1 tablespoon butter
2 cups cooked or canned beets, sliced or diced

Combine cornstarch and salt; blend in water or beet juice. Add vinegar, honey and butter. Cook slowly, stirring constantly, until thickened. Add sauce to beets. Let stand at least 10 minutes to blend flavors. Makes 4 servings.

HONEY CORN BREAD

1 cup all-purpose flour
3 teaspoons baking powder
1 teaspoon salt
1 cup yellow cornmeal
1 egg, slightly beaten
1 cup milk
1/4 cup melted butter
3 tablespoons honey

Mix flour, baking powder and salt together. Add cornmeal. Combine egg, milk, melted butter and honey. Mix well. Pour into flour mixture; stir until just moistened. Pour into greased 9x9-inch pan. Bake at 425° for 20 minutes.

CHRISTMAS CHOCOLATE HONEY RINGS

1 cup butter
1 cup honey
2 cups flour
1 teaspoon baking soda
2 tablespoons grated blanched almonds
4 egg yolks
3/4 cup grated sweet chocolate
1 teaspoon grated lemon rind
1 teaspoon cinnamon
1 egg white, slightly beaten
sugar colored green or red

Work all ingredients, except egg white, to a smooth and soft dough with the hands. When well-blended, roll out to 1/8 inch thickness on waxed paper and cut out with a floured ring cutter.

Place rings on greased baking sheet. Brush with beaten egg white. Sprinkle with green or red sugar. Bake in 350° oven for 10 to 15 minutes.

BARBECUED SPARE RIBS

4 pounds spare ribs
2 garlic cloves
2 tablespoons vinegar
1/2 cup chopped onion
1 teaspoon prepared mustard
2 tablespoons thick steak sauce
1-1/2 cups catsup
1/2 teaspoon salt
1 cup honey
1/2 teaspoon black pepper

Cut the spare ribs into serving pieces. Simmer in enough water to cover plus 2 teaspoons salt for 1/2 hour. Mix remaining ingredients and cook over low heat for 5-7 minutes. Drain spare ribs and place in shallow baking pan. Pour barbecue sauce over ribs and bake at 400° for 45 minutes. Baste every 10 minutes.

ANGEL BISCUITS (DELICIOUS!!)

The beekeepers of Anderson County produced a small honey cookbook with a wonderful collection of recipes. The cookbook was sold to gain funds for the association.

1 package yeast
2 tablespoons lukewarm water
5 cups bread flour
1 teaspoon baking soda
3 teaspoons baking powder
3 tablespoons honey
1 teaspoon salt
1 cup shortening
2 cups buttermilk

Dissolve yeast in water. Add honey. Sift flour with other dry ingredients. Cut in shortening. Add buttermilk, then yeast mixture. Stir until flour is dampened. Knead on floured surface for 1 minute. Roll out to 1/2-inch thickness. Cut with biscuit cutter. Bake at 400° for 12-15 minutes. This dough can be refrigerated for up to a week and used as needed.

Imogene Farmer

CINNAMON HONEY BUTTER

This is for your Angel Biscuits!

Blend:
1/2 cup butter
1/3 cup honey
1/2 teaspoon cinnamon

POPPY SEED DRESSING

1 cup seedless raspberry preserves
1/3 cup honey
1 cup red wine or raspberry vinegar
1/2 cup lemon juice
1-1/2 cups vegetable oil
1 tablespoon poppy seeds
1 teaspoon salt

Combine all ingredients in blender jar. Blend about 40 seconds or until dressing has creamy pink appearance.

What Should I Bring?
Alison Boteler

Thanks to all the great cooks of Tennessee for sharing their recipes with all those in other states. Recipes are a great way to travel.

Q&A ... Cont. From Pg. 53

Burning Bees

This year I have seen many more bees on the outside of the hive, possibly due to the hot weather. I think most of them are field bees that will not have anything to do until Fall. So rather than treating for mites, why not burn these extra field bees? This might same some honey and kill lots of mites too.

Jim Harris
Columbus, CA

This cannot be a very good idea. For one thing, it violates the basic rule of beekeeping, which is to have strong hives all the time. The stronger your colonies are in Summer, the stronger they will be in the Fall, when you will need them. Destroying bees, thinking that this would get rid of mites too, would not eliminate the need to treat for mites. It would only weaken your colonies, to no purpose.

Spotty Brood

I started a hive in early July with a new Carniolan queen and have been feeding them syrup. They have now filled out about six combs. The capped brood is very spotty. Is this because the queen cannot find room to lay?

Bert Clayton
North Charleston, SC

No, a good queen lays a solid pattern of brood even when there is lots of honey and nectar in the combs. Spotty brood from a new queen is an indication of a defective queen.

Questions are welcomed. Address: Dr. Richard Taylor, Box 352, Interlaken, New York 14847 enclosing a stamped envelope for response.

?Do You Know? Answers

1. **True** There is no proof, but it is suspected that Varroa mites entered the country in an illegal shipment of bees (queens) from Brazil. Genetic/morphometric studies have shown that the source of Varroa mites in the United States is South America.
2. **True** European foulbrood disease strikes primarily in mid- to late Spring (May and June in northern temperate areas), the time when colonies should be building up to maximum populations. In most cases, the disease symptoms disappear with the onset of a surplus honey flow. European foulbrood also can be found in the Fall, but it is not as common as in the Spring.
3. **True** American foulbrood spores germinate approximately one day after ingestion by the larva. After germination, the bacteria multiply in the midgut and penetrate into the body cavity through the gut wall.
4. **False** Healthy worker larvae are pearly white in appearance, while diseased individuals show a color change ranging from dull white to brown and finally black with the progression of the disease.
5. **False** Even though there are distinctive odors associated with American foulbrood and European foulbrood, odor is not considered to be a reliable diagnostic method of distinguishing between the two diseases. Odors associated with European foulbrood vary with different secondary invading bacteria.
6. **True** European foulbrood generally kills larvae two to four days old while they are still coiled in the bottom of the cells. With American foulbrood, death typically occurs after the cell is capped, during the last two days of the larval stage or first two days of the pupal stage.
7. **False** *Melissococcus pluton*, the bacterium that causes European foulbrood does not form spores. This bacterium overwinters on the sides of the cell wall or in feces and wax debris on the bottom of the hive.
8. **True** While American foulbrood attacks mainly worker brood, occasionally queen and drone larvae are affected.
9. **True** While numerous chemical compounds have been evaluated in North America for the control of chalkbrood disease, there are currently no chemical compounds registered for treating this disease.
10. D) Birds
11. A) American foulbrood
12. C) Leafcutter bees
13. E) Mexico
14. B) Epithelial cells that line the midgut
15. B) European foulbrood
16. Mixing Terramycin with powdered sugar and sprinkling the mixture on the top bars in the brood nest.
    Incorporating Terramycin in a soft patty made of hydrogenated cooking oil and sugar (antibiotic extender patties).
17. After worker bees emerge from their brood cells, female tracheal mites migrate into their tracheae by passing through the first thoracic spiracle. The first pair of spiracles of the thorax are the only ones on the body that are large enough to permit the passage of the mite.
18. Since European foulbrood and sacbrood are both stress diseases, requeening accomplishes two things: It gives the colony a more prolific queen which may be genetically less susceptible to the diseases, and permits a time lag between brood cycles that allows the house bees to remove diseased larvae from their cells.
19. Purple brood is caused by the shrub Summer titi or southern weatherwood (*Cyrilla racemiflora*). It occurs in swampy areas of the southeastern United States. The disorder gets its name from the fact that affected larvae turn a purple or blue-ish color. Dead larvae are found soon after bees start gathering nectar or pollen from the blossoms, and the death rate continues until the blooming period is over.
20. The bee louse is a wingless fly (insect) with three pairs of legs, and the *Varroa* mite has four pairs of legs. Both can be seen with the naked eye.
21. Male tracheal mites are slightly smaller than female mites; however, the best way to differentiate between the two is to look for variations in the fourth pair of legs. The fourth leg is much shorter and more stubby in the female than in the male. In addition the female fourth leg lacks a claw and has two very long hairs in comparison to one long hair in the male.

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.

Glean gs

JULY, 1999 • ALL THE NEWS THAT FITS

U.S. EYES ARGENTINA IMPORTS

The U.S. honey producer organizations have begun an investigation of honey imports from Argentina to see if some action can be brought under U.S. trade laws which would reduce those imports.

The American Beekeeping Federation and the American Honey Producers Association have authorized Washington attorney Mike Coursey to undertake a study of the honey export practices of Argentina. Mr. Coursey has been the lead attorney in the beekeepers' successful antidumping action against honey imports from China.

As the antidumping action reduced the flow of Chinese honey, the void was filled by honey from Argentina. In 1995, a total of 27.6 million lbs. was imported from Argentina. In 1997, those imports totaled 107.1 million lbs. In 1998, the flow of honey from Argentina dropped to 69.1 million lbs., but the price dropped as well.

The study of the Argentine honey situation will consider both the possibility of dumping and the question of unfair government subsidization of the Argentine honey industry.

ApiExpo '99 - Be There

The **ApiExpo'99** trade show will be an international event that every beekeeper will want to experience!

ApiExpo'99 is an integral part of the 36th international beekeeping congress, **Apimondia'99**, September 12-18, in Vancouver, Canada. This year, the ApiExpo trade show will be bigger and more comprehensive than ever! Held in the Exhibit Hall of the spectacular Vancouver Trade and Convention Centre, ApiExpo'99 will showcase the diverse business activities and educational activities relating to beekeeping, honey, and other hive products. The range of products that can be viewed at ApiExpo'99 will make this the largest display related to beekeeping ever held in North America.

Interest in ApiExpo'99 to date has been exceptional. Booths have been rented to participants from 26 countries throughout the world, including 12 European countries, Australia, New Zealand, and several countries from Asia, Latin America (4 countries), South Africa, and the USA and Canada. Participants will display all types of beekeeping equipment from general beekeeping supplies to specialized extractors and hive loaders; equipment for comb honey production; honey and beehive products; queens and queen-rearing supplies; pharmaceuticals; bee venom and medicines; perfumes and cosmetics; books and magazines; and national and educational displays. Don Dixon, chair of the Apimondia'99 organizing committee, comments, "The opportunity to view such a wide range of products and business under one roof will be extremely exciting for Apimondia'99 participants. There has never been an ApiExpo with this much diversity."

Entrance to ApiExpo'99 is included in the registration for Apimondia'99. The floor plan, including currently registered displayers, and registration forms can be accessed from the congress website: www.apimondia99.ca. Registration materials can be obtained from Venue West Conference Services, #645-375 Water Street, Vancouver, BC, Canada V6B 5C6; email: <*congress@venuewest.com*>.

SNAPPLE & POLLEN!

Snapple Beverages is launching Elements, its new line of functional fruit drinks and teas. The 20-ounce products are rolling out across the nation with New York as the next market slated to receive this line of all-natural, herbal enhanced beverages. The new Elements product line features four fruit drinks: Earth, Sun, Fire, Rain and two teas: Lightning and Moon. Each product combines herbal ingredients and exotic fruit flavors to help consumers "refresh their natural resources." For example, Earth is a grape-cranberry fruit drink that is fortified with ginseng, bee pollen, grapeseed extract, herbs, and antioxidants. Sounds like the drink for me-give me a couple of Earths please.

AIA HONORS TWO

Marla Spivak

A 1999 AIA Exceptional Service Award was presented to Dr. Marla Spivak for Outstanding Work in Apiary Research. She is recognized as an outstanding bee scientist, having performed significant research, first as a graduate student and later as an independent research scientist. She has worked with Dr. Orley Taylor on the Africanized honey bee and with Steve Taber and Dr. Martha Gilliam on developing and testing hygienic bees that were resistant to chalkbrood disease. She used this knowledge for developing *Varroa*-resistant stocks currently being bred and tested by beekeepers. As a result of her work, she was awarded a five-year grant from the NSF Young Faculty Early Career Development for "Neurothology of Hygenic Behavior in Honey Bees."

Dr. Spivak currently does research, teaches, and serves as an extension specialist for the University of MN. She advises the research of four graduate students and one post-doctoral associate. In the last six-years she has received over $500,000 in grants for her research. She has written numerous scientific and extension publications and is known nationally and internationally for her research.

A 1999 AIA Exceptional Service Award was presented to I. Barton Smith, Jr. for Outstanding Work in Apiary Regulatory and Administrative Affairs. He has served as AIA secretary since 1984 during which time he has taken the job of compiling a summary of annual meeting activities and developed a first class publication of AIA proceedings. He is also knowledgeable about previous AIA resolutions and actions, thereby, keeping the organization on track when tackling current AIA issues. He has provided valued council to incoming officers who are unfamiliar with AIA industry and political associations, and has often offered his services as AIA representative at these functions. His educational background and his own assessment of honey bee disease and pest issues places him head and shoulders above others.

HONEY DOWN, DOWN UNDER

Australian beekeepers are experiencing their worst season in decades because low rainfall during the recently ended southern Summer resulted in patchy blossoming of plants.

South Australian Apiarists Association president Keith Gibbs said it was one of the worst seasons he and his members had seen.

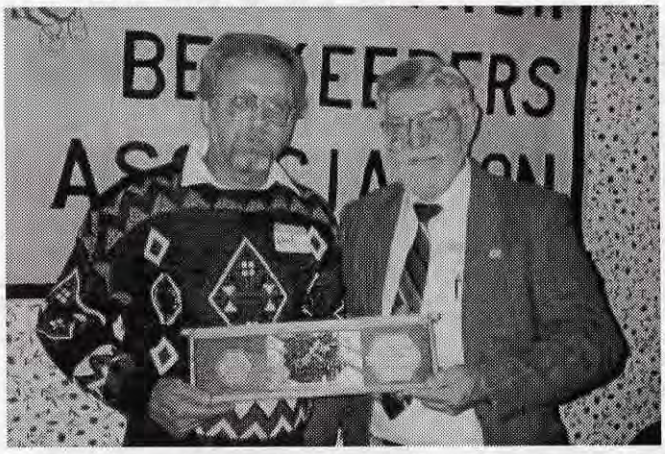
"It's a real battle right across Australia," he said. "The lack of Summer rain over the last five or six years probably. We have really never had good Summer rain right across the country. The rain fall this Summer has been so patch it's not funny. If you're in the right place you got a little bit of honey but the rain let us down. It was there right up until Christmas but we just never got enough rainfall all of the time. It was just too dry."

-Alan Harman

SPENDING, FOOD DOWN

According to a recent article in American Demographics http://www.demographics.com/publications/ad/99_ad/9904_ad/ad990401.htm (April 1999), household spending patterns have changed dramatically. Americans are spending less on food. Between 1987 and 1997, spending by the average household on food at home fell 3%, adjusting for inflation. Spending on food away from home fell a much larger 13%. Maybe, we just can't eat any more. Calorie consumption is at an all-time high, from what I read. Check out the complete article on the Web.

DUBIOUS HONOR!



Starting out with only eight colonies Woody Harrell's honey bees managed to swarm over 50 times, earning him the dubious title, "Swarm King of 1998." He is shown (on left) receiving the humorous award from Art Halstead, Program Chairman at the Tidewater VA Beekeepers Association's annual award dinner meeting held last month. The award is a photo of swarm #35.

ABF Contest

NC WINS 4H

A simplified story of the lifecycle of the honey bee, followed by a video, a game (Bee Buzz Bingo), and a round of honey-tasting were the elements which captured the first place award in the 1999 American Beekeeping Federation 4-H Essay Contest for Kempton Healey of Chapel Hill, NC.

Kempton and her competitors were charged with creating a lesson plan and activity sheet to teach 3rd Grade elementary school students about bees and beekeeping. Essays were entered in the national judging from 20 states. Each state winner will receive a copy of Ted Hooper's "Guide to Bees and Honey."

Kempton, 15, is a freshman at East Chapel high School and a member of the Express Yourself 4-H Club. She receives a cash prize of $250 for her efforts, which she entitlted, "The Buzz About Bees."

The second place essayist is Justin Stein, 17, of Hastings, NE. He entitled his lesson plan, "The Amazing Bee." His activity sheet was a Bee Word Search, which included bee-related words from bee to larvae to wax. As the second place winner, Justin receives a cash award of $100.

Boone Gray, 13, of Rockford, TN, is the third place winner. He receives a $50 cash award for his lesson plan. He included several activity sheets, including a crossword puzzle, a bee-parts drawing, and a list of nectar-producing and bee-pollinated plants from which students are to identify those grown at their home.

The judges said that all the essays were very good and that the top three were very close. The ABF plans to adapt the entries into materials which can be supplied to teachers who contact the ABF Office for teaching materials.

For the "turn-of-the-century" 2000 essay contest, 4-H'ers are being asked to write about "Honey Bees and Humans Through the Centuries." They are to explore the variety of ways man has utilized honey bees and their products since the beginning of this relationship.

A student interested in writing should contact his or her local 4-H office for contest details.

But Not Bees

COW & CHICKENS

A current guide to the "do's and don'ts" of transporting and handling farm animals is now available from USDA's National Agricultural Library.

The new publication, "Information Resources for Livestock and Poultry Handling and Transport," 1990-1998, provides access to scientific, training and organizational resources for farmers, livestock and poultry producers, researchers, animal caretakers and other animal handlers. The publication is available from NAL's Animal Welfare Information Center.

The publication contains bibliographic citations, audiovisuals, governmental and institutional guidelines, Internet resources, and expertise from individuals and organizations. A special section lists organizations concerned with livestock transport and handling issues. Information is provided on how to contact each organization either via electronic means or postal address and a brief summary of the resources and services each organization offers.

Preceding the bibliography is the article, "Assessment of Stress During
Handling and Transport," by Temple Grandin, Ph.D., from Colorado State University. Dr. Grandin is a recognized authority in the field of livestock handling.

Copies of the publication are available free of charge while supplies last by contacting the Animal Welfare Information Center, National Agricultural Library, 10301 Baltimore Avenue, Beltsville, MD 20705-2351, telephone 301.504.6212, fax 301.504.7125, e-mail awic@nal.usda.gov.

NAL is part of the Agricultural Research Service, USDA's chief research agency. NAL is the largest agricultural library in the world and one of four national libraries in the United States, along with the Library of Congress, the National Library of Medicine and the National Library of Education.

LANGSTROTH ... Cont. From Pg. 50

queen . . . and all other operations may be performed without injuring a single bee, thus preserving the apiary from constant irritation and keeping the bees always peaceable. It is obvious that the movable frames may be adapted to almost any hive, and that they will be of the greatest practical benefit.'" Langstroth may not have been properly trained in scientific methods, but he was wise enough to realize that it is imperative to record observations immediately and that those not promptly set down often become utterly worthless, because man's memory is unreliable.

One can imagine the excitement the next spring when, having moved his entire apiary to West Philadelphia to a site now part of the lovely campus of the University of Pennsylvania, he and Henry Bourquin, his apiary manager and a skilled cabinetmaker as well as a first class beekeeper, entered upon the first trials of his invention. And their mounting exhilaration as they installed the first frame ends on the bars! The two were so absorbed in manipulating these new frames, removing them with no trouble from the hive-body and replacing them without injuring the bees, that they did not notice the presence of an old beekeeper friend who had come up and was watching them work. They did not even hear him as he spoke, until he fairly shouted, "Friend Lorenzo, you are so taken up with your new hive that you seem unable to hear me, or to see anything else. No doubt you think you have made a great invention; but I say you have made no invention. You have made *no invention* at all, but rather *a perfect revolution* in beekeeping!"

As soon as it was feasible, Langstroth applied for a patent on his invention, and it was granted in the fall of 1852. Whether he was hopeful of improving his financial condition by having his frame universally adopted, we do not know. One of the pathetic aspects of his work is shown by a letter written later by his wife begging the Commissioner of Patents to renew his patent since it had not been financially profitable to the inventor.

Because Langstroth now desired to give all his attention to his bees, he disposed of his school that spring (1852). But as had so frequently happened before, he had such a severe attack of his head trouble during the summer that he was completely prostrated. Since he could not even give instructions to his assistant, he was forced to abandon the business and sell his bees. Of this period of discouragement, he writes: "How often I can recall similar experiences, when in the heat of the race, and sometimes with the goal of success apparently almost gained, I have sunk down on the course, unable to take another forward step! I write these words with no disposition to murmur against any of God's providential dealings with me."

This ended Langstroth's life in Philadelphia, but his connection with the city was not severed. Since there was the usual pressure for money, Langstroth's wife accepted a position in the city as assistant teacher in a school for young women, which their two daughters could attend, while Langstroth went to live with the family of his brother-in-law, Almon Brainard, in Greenfield, Massachusetts. During the years in Philadelphia Langstroth had preached probably more than half his Sundays and, when he returned to Greenfield, had sufficiently recovered his health so he soon was supplying the pulpit of the Congregational Church of Colrain nearby. His wife and daughters spent their vacations with him in Colrain and his son worked on a nearby farm, and Langstroth reports each of their family reunions as "a bright oasis in those long separations."

While living in Greenfield and Colrain, Langstroth tried with little success to sell his patented hive. But he wrote his famous book, "Langstroth on the Hive and the Honeybee." This was revised and re-issued many, many times from 1853 when it first appeared. This book was Langstroth's second great contribution to beekeeping, for, like his movable frame hive, it went 'round the world.

Between Langstroth's hive and his book, he became so widely known and respected that the two periodicals, *Gleanings in Bee Culture* and *American Bee Journal*, both published his contributions simultaneously. This great respect that he engendered among beemen everywhere also made his third contribution to American beekeeping much easier than if he had not been famous. This third service to beekeeping in America was the importation of Italian bees, in which he shared. There had been sporadic attempts to import colonies, but these were at first not successful. Samual Wagner, with whom Langstroth had been associated in other ventures, notably in an attempt to market his movable frame hive, had arranged for a shipment of Italians as early as 1855. It was made, but the bees perished on the way across the ocean. Four years later Wagner enlisted Langstroth's aid and, together with Richard Colvin of Baltimore, they ordered a colony from Italy's leading beekeeper, only to learn long afterward that the order was never received.

About this time the U.S. Department of Agriculture undertook the importation of Italian bees, and Langstroth's assistance was enlisted. He was the one who handled the single remaining Italian queen in Flushing when the first shipment arrived, and saved her. And he saved one or two others in another shipment that survived the trip a few days later.

Langstroth's later years were not happy. In 1870 his only son died; in 1872 his friend Samual Wagner died; and the following year his wife died. In 1874 he sold his apiary and never again had more than a few colonies at any time. His head trouble bothered him for long periods at a time, and finally his household, now consisting of himself and his daughter and her husband, Mr. H. C. Cowan, moved from Oxford, Ohio, where they had been living, to Dayton, Ohio, where Cowan's business required him to live.

On Sunday, October 6, 1895, Mr. Langstroth was to give the sermon at the Wayne Avenue United Presbyterian Church in Dayton. He was nearly 85 and his health, while it had been good of recent months, was really only fair. He mounted to the platform, where the minister had moved the pulpit to one side and provided a chair. He started his sermon with these words, "It is of the love of God that I wish to speak to you this morning-what it has been, what it is, what it means to us, and what we ought————."

Lorenzo Langstroth had completed his life. BC

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The Trojan Beekeeper

Ed Hughes

Just outside Martin, South Dakota, on the Little White River, I found the very best spot to put bees. Unfortunately, someone found it before me. In mid-June, the place was solid yellow clover to the horizon and beyond. It didn't seem fair that I just found out about it now and somebody else knew about it before me. If I had found it first, I am sure I would have shared it, but that's not the way they do things there.

Angered that I had once again had my constitutional rights mutilated, I hatched a guileful scheme.

I would buy a cheap utility van, the kind without windows, fill it up with 10 to 12 hives, and drive it to the spot with all the clover.

Picking a wide spot on the shoulder, I would stop the van and pretend to have mechanical trouble. Getting out, I look under the hood, loosening the distributor cable just enough so it won't start.

While checking for what might be wrong, I have occasion to climb up on the roof and uncork the largish hole I had previously chiseled through the metal to let the bees come and go. As soon as I pull the plug, I run like the dickens toward the rancher's house because bees corked up in a van on a nice day will make somebody pay if they can.

Arriving at the ranch house, they ask me why I run so.

"Oh, it's nothing," I say, "but I do seem to be having some mechanical troubles with my trusty van. Would you mind if I left it here a bit until I can get some parts?"

"Why no," they might say. "Leave it here a couple of days if you have to."

"It might be a tad longer than that," I explain, and here I am not sure whether to use my standard I'm-an-astronaut-on-call ploy, or I'm-due-for-brain-surgery-tomorrow-and-will-be-out-sick-for-the-next-10-weeks gambit.

"What happens," asked my trusty wife, Bobbalee, when I told her the plan, "when your bumper crop of honey causes the back axle to snap?" She's always punching holes in my great money-making ideas.

Not satisfied with her criticism, I tested the idea on my rancher friend, Kurt, to see if he thought it possible. He thought the brain surgery part showed promise, but I could tell he was worried.

"You don't think this has been tried before?" he asked.

"You think is has?"

"It's just like the cattle business – everything has been tried at least a dozen times. That other beekeeper will spot the broken axle right off."

"I suppose you're right."

"You know I am," he said, and he usually is. Then, after a moment's thought, he said, "What you need is a legal loophole."

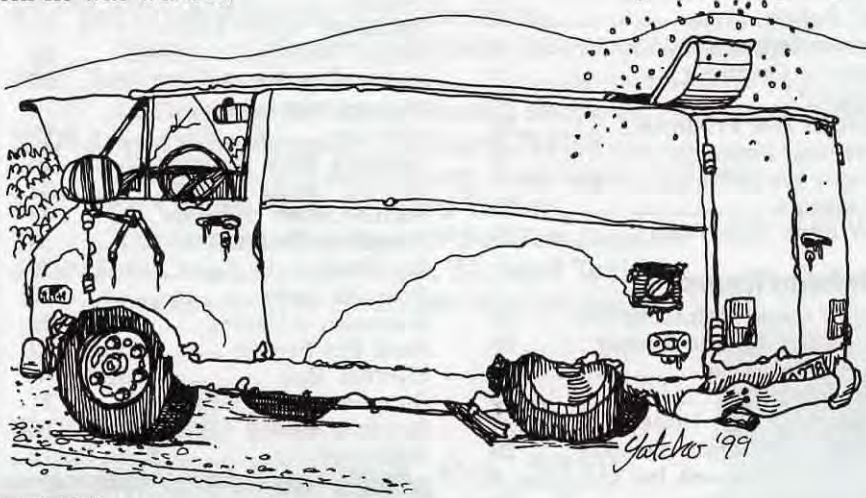
"Like what?" I asked, watching a great mind at work.

"Like maritime law. Nobody around here knows anything about maritime law. You sneak the bees up the Little White River toward Martin on a houseboat, anchor it in midstream, and hire the cheapest lawyer you can find. The Little White River becomes navigable waters for the first time in its history, and falls into federal maritime law and the jurisdiction of the Coast Guard. While the other beekeeper's lawyer and your ambulance chaser duke it out, you've got your 10 weeks in."

"Kurt, you're a genius."

"Ah, it's nothing."

Now all I need is a houseboat and a lawyer.



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