Bee Culture

DECEMBER 1995

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Do You Know?, Pg. 675

COLUMNS

DEPARTMENTS

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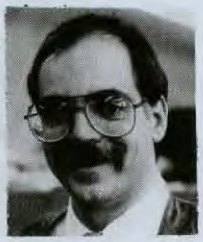
Publisher



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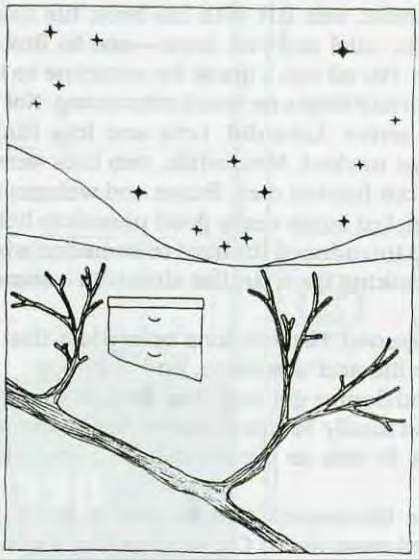
FEATURES



Cover
This is the month of longest nights, when all, it seems, is dark. But inside that solitary box life begins anew, again, when little else appears alive. And next year will be better.

Illustration by Mike Yatcko

Bees in Eritrea, Pg. 685

L.L. Langstroth, Pg. 696

Strictly Perennials, Pg. 699

Country Queens, Pg. 690

Observation Hives, Pg. 693

INNER COVER

Awhile back, a rather peculiar event occurred on these pages that wasn't fully explained. It raised some questions, and not a few eyebrows.

Back in the classifieds, Richard Taylor made a query regarding his search for someone to help with his children, and his bees. Although a life-style change was indicated in the ad, what it was, wasn't.

So, let me explain. It seems Richard and his wife had chosen different paths in their lives and gone their own ways. Richard, who lives in an old, large, rambling, rather disjointed farm house, was left with his bees, his fish (he raises hundreds for sale) and two boys – one in first and one in third grade. His ad was a quest for someone to help.

But no appropriate response was forthcoming. Not that responses didn't arrive. Lots did. Lots and lots Richard said. But none that worked. Meanwhile, two kids were living on a healthy, but limited diet. Beans and weiners were a staple, I was told, but some really good pancakes helped.

Then, a friend introduced Richard to someone who, in some ways, was looking for a similar situation – someone to help.

She, as it happened, had not long before lost that special person in her life and was alone, and unhappy.

So Richard and Connie got together, first on the phone, then by letter, and finally Richard visited her at her home in North Carolina. It was, as the saying goes, love at first sight.

The romance blossomed and in only a short time Connie had moved from North Carolina to New York. And in early September, Connie and Richard Taylor were married.

Connie is fairly well known in the beekeeping community. She has written many articles over the years, some here, some in other journals, some with her former husband, some by herself. Connie, if you haven't guessed, was married to Arnold Krochmal until he died last year.

Today that old, rambling farm house has a feminine touch again, and there's more than beans and franks on the menu. Life is better. You can see it when you visit and tell when you talk. Richard has a spring in his step and a smile in his voice, and it's warmer inside that old farmhouse, where they all live together, near Interlaken, New York.

•

Recently, I discussed the problems associated with getting information generated by public funded academic studies into the hands of the people who not only can use the information, but are the ones who helped pay for it. I accused these people, these academic types, of arrogance, of stupidity and indifference. I see no reason to change my mind, nor have I had any, repeat any, come to defend their behavior. They don't read magazines like this because there is no benefit in it. Nor do they publish in magazines like this because there is even less benefit in it. I am not surprised. Disappointed, yes. Surprised, no.

I also said, in that article, that there were a few exceptions. And we all knew who they were because there are so few of them. In this magazine there is Mark Winston, Roger Morse, Clarence Collison, Dewey Caron and Tom Webster and occasionally others. They, and even sometimes their grad students, take the time and energy to share what they know, and what we paid for. There has also been a spate of articles from other Canadian researchers and their students. Thanks. But like I said, there aren't many.

But this time, rather than continue on that one way trip, I'd like to tell you about somebody who has done what I have asked. Has accomplished more than many, many researchers in terms of reaching those who can use the information she has access to, and, has continued to reach out even when it did not benefit her, or her studies.

Three plus years ago, Diana was offered the opportunity to return to college to complete her degree. She had started six or seven years earlier while in Wisconsin, but funding problems interfered, and that was that. Until this Ohio State offer came along.

The job, if you will, was to continue the studies on tracheal mites and grease patties begun by others at Ohio State and to generate information on tracheal mite behavior

Continued, pg. 705

Special People

KEEP IN TOUCH
Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 216-725-5624
EMAIL: BCULTURE@AOL.COM

MAILBOX

Pollen Collection

Clarence Collison said, "The amount of pollen collected by a colony depends upon the colony's immediate requirements " (October, '95 issue, p. 594, Answer No. 2). On more than one occasion I have seen a colony with no brood, no queen and no young bees, thus with no need for pollen, collecting at a rate approximately the same as one with current pollen needs. It's a good thing, too, that bees collect and store pollen substantially in excess of their current needs. Otherwise what would nurse bees and young bees do during those times, like late winter/early spring, when no pollen was available?

It seems to me that bees collect and store both pollen and nectar to the extent that both are available without reference their needs of the moment. Without this tendency, there would be no such thing as surplus honey, sometimes in quantities several times the amount consumed.

Collison also said "Foragers will clean themselves and discard this (misc.) pollen in flight." It is not unusual to see a forager return to the hive looking like she had been shaken up in a jar of pollen. Those foragers certainly showed no inclination to clean themselves in flight. I've never seen a bee leave the hive covered with pollen so I presume she and/or her nestmates cleaned the pollen off in the hive.

Dan Hendricks
Mercer Island, WA

IBRA In Costa Rica

Beekeepers and scientists from all around the world will be homing in on Costa Rica next August, for the 'Sixth IBRA conference on bees in the tropics; management and diversity.'

Costa Rica is an excellent venue for anyone interested in tropical bees and apiculture. Beekeeping with *Apis mellifera* has been carried out since the 19th century, though the character of honey bee management changed radically in 1982 with the arival and subsequent spread of Africanized honey bees. The management of stingless bees has a heritage of at least 2,000 years, and is still an important part of the rural economy in some areas.

We are still learning the extent of the diversity of bees in Central America, and Costa Rica in particular, but the rich variety of habitats makes the area a prime site for study.

A varied range of technical sessions, field visits, trade displays and social events will combine to make this na informative and enjoyable program, from August 12-17 1996. For information contact:

IBRA
18 North Road
Cardiff CF1 3DY
UK

Bumblebee . . . or not?

Have ya'll seen this? This is the first time I've ever seen honey (specifically wildflower honey) featured in a tomato sauce (see photo below). My husband and I can't agree if the likewise featured bee is a bumblebee, or a honey bee with a mite on it's back. What do you think?

Cynthia Buchsbaum
Rosharon, TX 77583

Continued on Next Page

MAILBOX

Apistan Abuse

I sincerely thank you for the article on abuse of Apistan strips in October *Bee Culture*. It is very informative.

Kindly answer the following question. I have been told by a beekeeper that it is cheaper to use the strip for five days and a second time after 15 days, to catch the mites from the newborn bees. Is this a good practice?

Jos. Kormann
Tampa, FL

Editor's Note: No. You can use the strips for a day or two to *test* your colonies for *Varroa*, but a five-day treatment is not on the label. Treat your colonies according to label directions – AND ONLY by label directions. Don't be cheap, don't be 'smarter' than the company and don't treat your bees illegally.

Honey Packer List

After reading Dr. Morse's article in the September issue featuring McLure's Honey, I thought I would write to you to see if you could help me find a list (however short) of reputable northeast honey packers.

I would appreciate any help you can give me. Thank you.

Kevin Fick
P.O. Box 601
Kealakekua, HI 96750-0601

Happy Holidays From All Of Us at
Bee Culture to You & Yours . . .

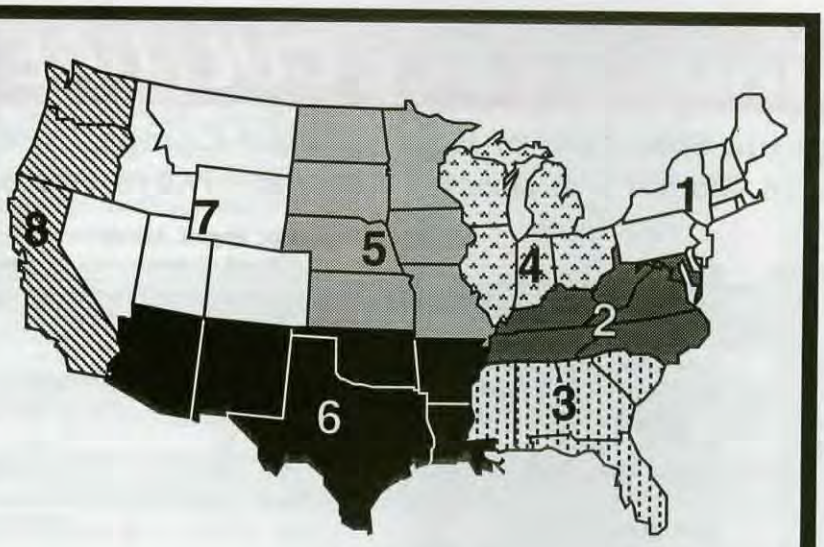
Kim Flottum
Mary Weisgerber
Kathy Summers
Dawn Teagan

DECEMBER Honey Report

DECEMBER 1, 1995

REPORT FEATURES

Prices shown are averages from many reporters living in a region, and reflect that region's general price structure. The Range Column lists highest and lowest prices received across all regions, from all reporters.



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	45.61	42.13	50.99	42.00	59.00	45.75	45.00	47.00	36.00-69.00	47.98	45.10	41.00
60# Amber	44.19	44.60	45.87	40.80	54.00	39.78	43.00	45.67	34.00-58.00	45.61	42.90	39.77
55 gal. Light	0.64	0.63	0.73	0.70	0.68	0.56	0.65	0.60	0.52-1.01	0.67	0.66	0.56
55 gal. Amber	0.58	0.55	0.61	0.69	0.69	0.50	0.62	0.58	0.42-0.78	0.62	0.61	0.53
Wholesale - Case Lots												
1/2# 24's	21.08	22.93	20.00	20.32	19.92	24.00	23.15	23.50	19.75-25.00	22.50	22.70	22.22
1# 24's	30.59	34.00	32.40	32.80	33.96	33.90	32.10	31.80	30.00-37.90	32.57	33.17	31.69
2# 12's	29.20	31.47	30.40	29.85	31.20	28.75	30.95	30.00	28.50-33.80	30.89	30.83	29.91
12 oz. Plas. 24's	27.82	29.20	30.71	27.60	25.56	28.08	27.95	25.70	24.72-38.40	29.02	28.17	28.11
5# 6's	29.58	33.50	36.00	33.15	25.95	28.50	30.25	29.75	21.00-36.95	31.78	32.45	30.11
Retail Honey Prices												
1/2#	1.52	2.08	1.63	1.09	1.18	1.95	1.29	1.26	0.98-3.50	1.52	1.37	1.40
12 oz. Plastic	1.68	1.90	2.50	1.64	1.48	1.77	1.75	1.49	1.38-2.50	1.74	1.71	1.64
1 lb. Glass	1.92	2.18	2.23	1.99	1.97	2.15	1.98	1.76	1.19-2.75	2.00	1.95	1.85
2 lb. Glass	3.27	3.60	3.48	3.12	3.08	3.39	3.25	3.68	2.89-4.00	3.43	3.33	3.30
3 lb. Glass	4.34	4.99	4.75	4.65	4.03	4.27	4.63	4.93	3.50-5.80	4.59	4.48	4.54
4 lb. Glass	5.15	5.47	5.75	5.65	5.59	5.39	5.45	5.50	4.95-6.30	5.62	5.74	5.46
5 lb. Glass	6.75	6.73	6.78	8.47	6.78	6.07	6.65	6.65	5.50-9.75	7.08	7.07	6.79
1# Cream	2.45	3.05	2.70	2.19	2.09	3.27	3.15	1.91	1.58-3.95	2.57	2.44	2.15
1# Comb	3.18	3.23	3.00	3.75	2.83	4.48	4.50	2.86	1.95-5.00	3.35	3.45	3.08
Round Plastic	2.86	2.75	3.25	3.25	3.43	4.18	3.25	2.68	1.70-5.00	3.05	3.07	3.04
Wax (Light)	1.85	1.50	2.00	2.15	1.85	1.33	1.70	1.72	1.00-3.95	1.88	1.88	1.74
Wax (Dark)	1.51	1.24	1.73	1.85	1.60	0.88	1.65	1.45	0.75-3.25	1.54	3.81	1.31
Poll. Fee/Col.	28.27	25.00	25.00	32.50	31.75	10.00	35.00	32.00	10.00-55.00	30.25	29.70	30.19

MARKET SHARE

Still need reporters in Regions 3 and 7 – get a free subscription and help out.

World production only average this year, but demand increasing. With production in China down, as well as other leading producers, global price should remain high for another year or so.

Read special insider's report on China production right here next month.

Region 1

Wholesale prices steady but retail moving up fast. Wholesale will climb soon, as supplies dwindle. Demand steady to increasing on an average to a bit above crop. Lots of dark produced so light is a premium now. Mites a real problem for late harvesters.

Region 2

Retail and bulk strong, prices only steady on pails. Wholesale will continue to climb to meet country average, which will make retail even stronger. Demand steady on an average crop, but mites still causing problems so colony numbers down.

Region 3

Prices taking off, finally, catching up. Demand strong on a reduced crop, with lots of people looking for bulk. Citrus like gold now. Mites, if untreated, devastating. However, many seem to have control – at least for now.

Region 4

Prices only steady at reporting time, but probably not the case by the time this is read. Demand is strong on an average to good crop, especially for bulk. Retail in region holding about the same for price, but sales are increasing. Mites critical here due to late crop, and late treatment. Spring will be silent.

Region 5

Prices at bulk and wholesale skyrocketing to catch up for lost time. Demand for bulk very strong, with 75¢ for white no longer the exception. Retail strong on shelves reflects prices generally. Sales at high prices seem to hold steady. Mites, where harvest was late, very bad.

Region 6

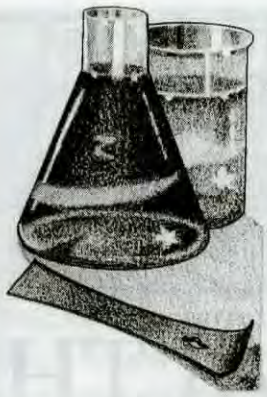
West section still lagging behind in price and demand. Time will tell. Eastern half stronger, and improving. Sales low, and high respectively. Average crop will sell out early. Mites as nasty as ever, but AHB increasing costs, too.

Region 7

Prices inching up in mountain area, not as fast as in other locations, but some increase. Demand, though, will increase, especially at wholesale, and prices should climb (and probably have by early December). Mites a moderate problem as control strategies seem to be working.

Region 8

Prices fairly steady, having climbed earlier this year. Demand steady on average to above crop. Prices will climb as supply dwindles. Mites a big threat to pollination contracts this spring. Influx of out-of-state bees will bring its own set of complications.



RESEARCH REVIEW

roger morse cornell university ithaca ny

"Bees have iron in their bodies, but we don't know why."

There is a small war among scientists over the role played by the earth's magnetic field, in animal orientation. The real problem, I think, is everyone's frustration over the fact that no one can figure out what is taking place. Many animals appear to respond to the earth's magnetic field but where are the magnetic receptors in the nervous system? No one can seem to find them.

A paper published in mid-1994 that attempted to explain how honey bees respond to the magnetic field has just brought three harsh letters of criticism. These letters do not present any new facts, but they obviously disagree with what was written last year. One of these letters states that the authors of the 1994 paper "misinterpreted their observations." That is not a very kind remark! These three letters come from various sources (Ontario, California and Oregon). I do not know any of these people, but I am pleased to learn there is so much interest. Obviously, a number of people are intrigued and are working on the problem using honey bees as their experimental animals. Hopefully, that kind of effort will eventually resolve the questions.

Background

During the past 25 years, a number of animals have been shown to respond to magnetic fields. Among them are bacteria, algae, hornets, salmon, homing pigeons and others. How they do so is not clear, but many of the experiments that have been done show responses that are repeatable, and therefore, one can only believe they are valid.

The thought that honey bees use the earth's magnetic field in the dance language and as an orientation cue in comb building was first published in 1972 (Lindauer and Martin, 1972). It was stated that dancing bees align themselves in definite directions that show deviations on a daily basis. However, these deviations may be corrected by compensating the earth's magnetic field.

The report on comb building came from a student in Germany who never published his research, leaving us with little information as regards his techniques. The little information we have comes from a brief statement by his major professor. What was stated was that bees in a swarm would build comb in the same plane as the comb in their parent colony. One of my students worked on this question and found that bees in natural swarms would do so. However, bees in artificial swarms we created by shaking bees from a colony would not. This is not surprising, as naturally swarming bees are physiologically different from bees in non-swarming colonies in a number of ways.

In 1978, a paper appeared stating that honey bees had a magnetic remanence. When worker bees were dried, crushed and their three body parts passed through a magnetic separator, it was found that only the abdomen contained the magnetic fraction. A magnetic remanence was also present in worker pupae.

Where is the iron?

Since the paper in 1978, iron granules have been found in honey bees in the fat body and the midgut, both in the abdomen. However, as has been pointed out by several people, just because there is iron does not mean that it plays a role in orientation. The source of the iron is probably pollen, which is known to be rich in it. I have examined the fat bodies of worker bees myself. It is easy enough to apply an iron-specific stain to it and see that iron is there in great quantity. One point that is not emphasized in any of these papers is that the size of the fat body varies greatly during the year with fall worker bees having the largest fat bodies that presumably they deplete in winter. One cannot easily find any fat body in old winter bees or bees reared early in the year. If iron granules are important in orientation, why would they be associated with the fat body, an organ that fluctuates so much in size during the course of the year?

Since the publication of the above papers, I have talked to several people about the earth's magnetic field and orientation by animals, including honey bees. I have found a great number of skeptics despite the fact that there is a great number of papers on the subject. In fact, there are some people who think the whole idea is a hoax. One of these friends pointed out that iron is a common element on earth and the fact that it is part of an animal's body should not be thought of as being anything special. This will be an interesting field to follow, but it is clear that there is a number of critical people ready to jump on any thoughts that are not well-documented.

References:

Hsu, C. and C. Li. *Magnetoreception in honeybees.* Science 265: 95-97, 1994.

Lindauer, M. and H. Martin. *Magnetic effect on dancing bees.* In symposium NASA SP-262, *Animal orientation and navigation*, Washington, D.C. 559-567 U.S. Government Printing Office. 1972.

Technical comments: Honeybees and magnetoraception. Science 269: 1888-1890. (letters by seven authors)

? DO YOU KNOW ?

Honey Bee Senses

clarence collison

The honey bee is well-endowed with senses which are very much like our own. Like other animals, the honey bee has to be in tune with its environment in order to survive. Honey bee senses include vision, touch, taste, smell, hearing and vibration detection, the ability to record the distance to forage, detection of relative humidity and carbon dioxide concentration and the position of its body relative to gravity. These senses are also needed for the coordination of its body functions. How well do you understand honey bee senses?

Please take a few minutes to answer the following questions to determine how well you understand this important topic.

The first 10 questions are true or false. Place a T in front of the statement if it is entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point).

1. ___ All three types of honey bees, queens, workers and drones have both compound and simple eyes.
2. ___ The long, densely hairy tongue is associated with the ingestion of liquid food and the sense of taste.
3. ___ Many of the hairs on the surface of a bee are touch sensors.
4. ___ The ocelli (simple eyes) act as light-intensity detectors rather than image-producing eyes.
5. ___ Sensory receptors are equally distributed over the surface of the antennae.
6. ___ Red flowers without ultraviolet light reflections appear red to honey bees.
7. ___ Hairs found on the surface of compound eyes have the primary function of protecting the lens.
8. ___ Worker honey bees use their paired antennae to detect the direction of an odor.
9. ___ Bees are able to locate the sun on a fully overcast day.
10. ___ All three castes of honey bees have the same number of antennal segments.
11. ___ The most attractive sugar to the honey bee is:
    A. Glucose
    B. Maltose
    C. Melizitose
    D. Sucrose
    E. Fructose
12. ___ Compound eyes are each composed of many lenses, each lens with its own receptor apparatus. Each of these units is called an ommatidium or facet, and the number of facets is highly variable for (or) within each caste. Please indicate the correct order of bee castes having the highest to the lowest number of ommatidia.
    A. Queen, Drone, Worker
    B. Drone, Worker, Queen
    C. Queen, Worker, Drone
    D. Drone, Queen, Worker
    E. Worker, Queen, Drone
13. Queen piping is a series of sounds produced by young queens in the colony. "Quacking" and "tooting" are two types of piping sounds produced by queens. Compare the conditions that elicit these two different auditory responses. (2 points)
14. Name three senses associated with the antennae. (3 points)
15. What body part is associated with the detection of heat, perception of carbon dioxide and relative humidity levels? (1 point)
16. Honey bees have ___ ocelli (simple eyes). (1 point)
17 Which caste of honey bee has the largest number of sensory receptors on its antennae? (1 point)
18. The two compound eyes are complex visual organs capable of a wide range of photoreceptive functions. Name three of the functions of the compound eye. (3 points)
19. Please give the correct caste for each of the two diagrams below (2 points)

A

B

ANSWERS ON PAGE 710

DON'T EVER IMPORT BEES FROM SOUTH AFRICA

Killer Bee Killers

mark winston

The grass is not always greener on the other side. In this case, I'm thinking of the other side of the world, in South Africa, where they have beekeeping problems that are much worse than any problems we have in North America today. Among the difficulties South African beekeepers face are mites, Chinese honey and Africanized bees, and they not only have the original version of the "African Killer Bee," they also have another killer bee that kills the killer bee! I'm referring to the "Cape Bee," (*Apis mellifera capensis*), a race of honey bee that has been devastating South African beekeeping. The honey bee used in most of South Africa is the African bee (Apis mellifera scutellata), the same bee that was imported to Brazil and has now arrived in the southern United States. This bee is difficult enough to manage, but there is another race of bee found at the very tip of South Africa, in the Capetown region, that recently made its way north and has been causing problems all over South Africa.

The Cape bee used to be isolated only in the Cape region, and for reasons we don't understand, never migrated north on its own. However, beekeepers in recent years began moving the African bee south to the Cape for pollination, and then back north for the rest of their season. Evidently, quite a few Cape bees got into the African colonies, were moved north, and have now become resident in the formerly African bee region. This is a major problem for South African beekeepers because Cape bee workers can lay eggs that develop into females, even though they don't mate. That by itself might not be so bad, except that these laying workers will take over a colony, eventually kill the colony's queen, and then the colony dwindles and dies. Sometimes eggs laid by these laying workers will be reared into queens, but then the colony swarms or absconds. Either way, the beekeeper is left with a dwindling and eventually dead unit.

The worst aspect of this problem is that there does not seem to be a cure. I recently participated in an electronic mail discussion group on the Internet started by the South Africans to solicit input from researchers around the world concerning what to do about this problem. Many of the best minds in bees drove this problem around the electronic highway for a month, and lots of questions were asked, but no solutions emerged. This is obviously a fascinating research area, but research on this problem has been going on for some time and has not helped the beekeeping problem. A large number of bee colonies are affected each year, and the term "devastating" is not out of proportion to the impact the Cape bee has had in South Africa.

Not surprisingly, there was considerable discussion in this group concerning how the Cape bee was moved out of its original and very narrow range, and why it succeeded in expanding northward now but had not done so previously. The how seems fairly well-established. South Africa has an expanding fruit industry in the south Cape region, and as this industry grew, the local bee colonies were not sufficient to pollinate the developing acreage. Pollination-oriented migratory beekeepers were hired from more extensive beekeeping regions in the north, thousands of commercial African bee hives were brought down to pollinate the crop, and Cape bee workers entered some of these colonies before they were moved back north. The problem was compounded because many South African beekeepers don't requeen with commercially reared queens, but rather split colonies and let them requeen themselves. As Paul Magnuson from South Africa put it, "This was a recipe for disaster. African colonies that had contact with the Cape bee began to develop strange symptoms: mysterious queen loss, laying worker activity, decrease in foraging, lack of normal defensiveness, and general demoralization."

These colonies did indeed requeen themselves, but with laying workers rather than with mated queens. A laying Cape bee worker is different from what we think of as a laying worker because she can lay female eggs, even without mating. A typical Cape bee takeover of an African colony involves some Cape workers drifting into the African colony, fighting with the African bees and laying eggs. The Cape bees kill the African queen at some point and continue to lay eggs for many months. Eventually, the colony becomes completely Cape, dwindles, and either dies or rears a Cape queen. The Cape queen route doesn't solve the prob-

Continued on Next Page

"The Cape bee was isolated in the Cape region, and never migrated north. Beekeepers recently began moving the African bee south to the Cape for pollination, and then back for the rest of the season. Quite a few Cape bees got into African colonies, were moved north, and have become resident in the African bee region."

KILLER ... Cont. From Pg. 677

lem, however, because even a queenright Cape bee colony will not be very productive. Rather, they continue to requeen themselves every few months, and rarely grow to a very large population.

This is not a trivial problem; about 150,000 colonies have been killed directly due either to Cape bee infestation or to legislation that requires "depopulation" of Cape bee colonies outside of their natural range. Most honey in South Africa is now imported, and the South African beekeepers are committed to finding a way to return to beekeeping with the African rather than the Cape race of bee. However, this is not as easy as it might seem. The Cape bee is so widespread by now throughout South Africa that nothing short of killing virtually all commercial colonies in the country has any potential to clean up the problem. Even then, the Cape bee may now be endemic in feral colonies and could easily repopulate a new batch of commercial bees.

The Cape bee problem poses some of the most interesting research opportunities in bees, and also is an area where bee research has the potential to have enormous beneficial impact on the bee industry. Perhaps the most interesting question is not "Why is the Cape bee causing problems?" but rather "Why didn't it cause problems before?" There are no dramatic geographic or climatic barriers to the spread of the Cape bee, yet it is only recently that these bees have become established outside of the very tip of Africa. The standard explanation has been that, in some way, the two races are ecologically so adapted to their respective regions that they have not spread into each other's territories. This theory was more tenable before the Cape bee began doing well in the African bee areas, but the Cape bee's recent success in the north has poked a huge hole in that theory.

Another fascinating research topic concerns why it is only the Cape bee race in which workers commonly lay female eggs. Laying workers of other bee races occasionally will lay a female egg, at rates of perhaps one egg in a thousand, but a Cape laying worker does it all the time, and in fact, does not lay many drone eggs. Is this a primitive trait that has almost disappeared in all other honey bee races, or is it a recent development in bee evolution that soon will spread throughout the world? I suspect it's a more primitive trait that we see surviving only in this small Cape population because it reflects a fairly uncooperative social situation in which workers and queens are fighting for who gets to reproduce. The rest of the honey bee world is more cooperative, with queens and workers further along the social spectrum toward cooperation rather than conflict, which seems to me to be a more advanced trait.

Another good question is why this trait persists at all in the Cape bee, regardless of whether it's an advanced or more primitive aspect of bee evolution. One explanation is that the southern Cape is very windy, and queens are frequently lost during mating flights. Thus, a colony's ability to requeen itself following queen loss through laying worker eggs might be selected for very strongly. However, honey bees exist and mate in other parts of the world with high winds, yet we haven't seen this trait become established anywhere else. No, the evolution of workers that can lay female eggs, and the isolation of this characteristic in the southern Cape region until recently, remain a mystery.

The most pressing research problem is what to do about the Cape bee, and here the world's bee brains seemed at a loss as to what to recommend, myself included. Lots of ideas flowed back and forth on the internet, but in the end, we really don't seem to know enough about the Cape bee to find the magic bullet that will return South African beekeeping to its formerly healthy and profitable state. Each of us applied our individual expertise to the problem: Geneticists suggested research on how laying worker eggs develop into females; population biologists proposed work to better understand hybridization between the races; and pheromone biologists such as myself suggested that the answer to the Cape problem might lie in a better understanding of chemical communication between workers and queens.

All of us were probably right; no single answer is going to solve the problem, but rather a broad understanding of this interesting bee's biology may lead to a gradual improvement in South African beekeeping. If I were still a young student, I think I would head to South Africa and begin working on the Cape bee. The research opportunities there are among the most fascinating on the planet and have great potential to contribute toward the survival and prosperity of South African beekeeping. If any one thing came out of this discussion group as far as research is concerned, it was that there are still major research problems in bees that are both biologically interesting and economically important. And, if any one message emerged for North American beekeepers, it was this: DO NOT, under any circumstances, import any bees from South Africa. If we didn't learn anything from African bees being imported into the New World, we would certainly learn from the Cape bee that the grass really is not greener somewhere else. BC

"This is not a trivial problem; about 150,000 colonies were killed due to Cape bee infestation or legislation requiring "depopulation" of Cape bee colonies outside their natural range. Most honey in South Africa is imported, and their beekeepers are committed to returning to beekeeping with African rather than the Cape bee."

Mark Winston is a professor and researcher at Simon Fraser University, Burnaby, B.C. Canada.

WORLD TRADE
Under The Spotlight

andrew matheson

What is the real future for the world honey market? How are changes to GATT and measures against trade protectionism affecting beekeeping today? Can beekeepers make more money by concentrating on niche market products?

These were just some of the questions addressed at a symposium held in Lausanne, Switzerland, on the world trade in bees and bee products. Organized by IBRA, the International Bee Research Association, this meeting took place last August during the 34th International Beekeeping Congress and was sponsored by the British Honey Importers and Packers Association.

Global Patterns

The keynote address came from Wayne Rumball of Canada, president of the International Honey Exporters Organization and managing director of the bee product trading company ODEM International. Wayne made two interesting points about honey trading before giving his personal ideas about where the honey trade is now.

First, it's obvious that the world honey industry is rather complex. Just when you think the market is about to take off, events in a distant country cause prices to swing the other way, often for no good reason. Recession, U.S. government policy, a good crop of honey in Argentina, a bad season in China, changes in consumer buying patterns – all can significantly influence the market.

The next point is that reliable and comprehensive honey statistics are actually very hard to obtain. The honey industry is rather small compared with trade in other products and as a result "official" information is often collected incorrectly or from the wrong source, or guessed at by people who are not involved in the industry enough to be well-informed.

Wayne based his presentation on figures from various government and trade sources, but even then the results had to be modified with a few "guestimates." When you do this, the bottom line becomes interesting, and the graphs show his appraisal of trends for the most important countries. The countries under review are Argentina, Canada, China, Germany, Japan, Mexico and the United States; Australia's figures were too incomplete to include in the totals.

In 1993, production in these selected countries fell below the level of consumption for the first time (see graph). This trend continued through 1994, and quite likely the 1995 figures will show a more dramatic spread between production and consumption for these countries.

Other statistics indicate that total hive count in these countries declined by 17 percent between 1987 and 1994. It's likely that these numbers continued to decline in 1995, mainly in China; modest increases are expected in Argentina and Canada, but probably not enough to offset the Chinese reductions.

Honey stocks for the end of production years have plummeted in recent years (see graph), from a peak of approximately 192,000 tonnes in 1991 to approximately 100,000 tonnes in 1994, mainly due to increased consumption. (A tonne is metric ton: 1,000 kg or 2,200 pounds).

Apart from these changes in production, there have been big changes in the market in the past few years. Perhaps the greatest change has been the developments in the U.S. price support program. The story has been told elsewhere, and beekeepers following the news have been able to keep up with the introduction, then removal, of the 140 percent duty, followed by the quota and minimum price schemes.

The preliminary dumping duty on Chinese honey imports effectively put a stop to all exports of Chinese honey to the United States, and caused a supply crisis in the states as packers were not prepared for such a high rate of duty. On top of this, Argentina, Mexico and Australia all had poor honey crops so there was no place to turn for adequate replacement supplies. Honey prices increased by 25-40 percent in the months that followed, and for the first time in at least 15 years, the entire U.S. domestic crop was sold out before the next crop was available.

As we know, in August the dumping duties were cancelled and instead, China was given an annual import quota for the United States at a set minimum price. Recently, perhaps as a result of the U.S. International Trade Commission investigation or for other reasons, the Chinese decided to institute their own system of export quotas and minimum prices. Since then, prices of all grades of honey from China have increased substantially.

So a lot has happened in the past two years: In 1993, the average price of ELA (extra light amber) honey from all origins was about $800US/ton, and today it is about $1,300US/ton. But

where will we go from here?

World stocks will probably reach an all-time low in 1995 because of increased consumption, decreased colony numbers and poor crops. Prices have already increased to reflect this situation, and the market is expected to remain strong well into the first quarter of 1996.

The down side of this is that the new price levels are likely to reduce consumption, and this reduction will probably be more significant in the United States than anywhere else as there, the higher prices are coupled with a lack of choice of supply. The quota agreement with the Chinese allows access to some supply of Chinese honey, but not enough to sustain a market of 160,000 tons. With European currencies being very strong at present, the higher prices could go unnoticed by consumers.

In the meantime, the higher price levels may spark an increase in colony numbers and higher production. While this is unlikely to happen overnight, the outlook for the last quarter of 1996 is for reduced or level pricing. By the last quarter of 1997, the market is unlikely to be able to maintain the higher price levels and higher production, and a market correction will result.

This of course assumes that beekeepers will manage to produce at least average honey crops over the next two years. Other problems in the industry, such as mites and Africanized bees, could reduce crops in major producing countries and help to prop up prices for a few more years to come.

There is also another potential factor to consider. Some people in the industry believe that Chinese honey production will continue to decline regardless of price levels, and that in the not too distant future, they will not be a significant player in the world honey export market.

Don't confuse marketing with selling

Marketing is the whole process of finding out what your customers want, planning and developing a product to satisfy those wants, and determining the best way to price, promote and distribute that product.

Selling is one part of promotion, and promotion is only one part of the whole marketing system.

Identify the best market niche for your product

Carry out market research. Study global trends: You're part of a world market, so you need to know about "baby boomers," green consciousness and Eastern medicines.

Develop a unique selling proposition

Why should a customer buy your product over all the others available? Remember, what is important is not what you think of the product, but what the customer thinks.

A unique proposition must offer something unique; it must be clear, concise and specific; and it must communicate an emotional want that makes an emotional connection with your customer.

Develop your marketing plan

As the saying goes, if you fail to plan, you plan to fail. Work out a flexible plan that uses a product's impact rather than its volume (the David and Goliath principle). The plan must have five elements: what you are really selling, what your market position is, how you will tell everyone about the product, how much the marketing costs will be, and when it will happen.

Help for developing countries

Developing countries and economies in transition from central control to a market system often need help with trade promotion. To provide this assistance, the International Trade Centre (ITC) works in areas including product and market development, trade support and information services, training and help with trade promotion.

The ITC works on technical cooperation projects with particular countries, as well as providing publication and information services from its headquarters in Geneva, Switzerland.

Assistance from the world community

The ITC comes under the umbrella of two organizations, the General Agreement on Tariffs and Trade (GATT; now replaced by the World Trade Organization) and the United Nations acting through a body called UNCTAD. The ITC works particularly closely with the United Nations Development Programme.

Contact: International Trade Centre UNCTAD/GATT (ITC)
Palais des Nations
CH-1211 Geneva 10
Switzerland

Marketing tips

Two active and successful marketers of bee products shared some valuable ideas about how to compete in an increasingly competitive marketplace. Alan Bougen of Comvita New Zealand, a company marketing a range of 60 apitherapy products worldwide, spoke on niche marketing of bee products.

A key point in successful marketing is developing a unique selling proposition. A very good example is the way Comvita is using research on the antibacterial properties of manuka honey, carried out in New Zealand by Dr. Peter Molan, to support a specific marketing effort. The clear and concise message is that the company offers a unique product, and this creates a want which makes an emotional connection with the customer.

Comvita has supported scientific research to give products such as honey and propolis valid claims to uniqueness. Alan pointed out that unsubstantiated health and efficacy claims have for too long given apitherapy products a bad name.

Live bees create problems all of their own when it comes to international trade. Gus Rouse of Kona Queens, Hawaii, brought home some of the difficulties of this business. But the trade has special opportunities, too. The very seasonal market for queens in many countries makes openings that wouldn't be available if all the demand came in one short period. Queens to California in February, Denmark in April, Indonesia in December – markets all there for the taking, if the producer is alert and adaptable.

Helping world trade

No doubt many beekeepers haven't heard of the International Trade Center in Geneva, but this body

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Necessity

"Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence." And again: "Sanitary and phytosanitary measures shall not be applied in a manner which would constitute a disguised restriction on international trade."

Equivalence

"Members shall accept the sanitary or phytosanitary measures of other members as equivalent, even if these measures differ from their own or from those used by other members trading in the same product, if the exporting member objectively demonstrates to the importing member that its measures achieve the importing member's appropriate level of sanitary or phytosanitary protection."

Non-discrimination

"Members shall ensure that their sanitary and phytosanitary measures do not arbitrarily or unjustifiably discriminate between members where identical or similar conditions prevail, including between their own territory and other members."

Risk analysis

"Members shall ensure that their sanitary or phytosanitary measures are based on an assessment of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations."

has done quite a lot to help trade in bee products, especially from developing countries. The ITC is part of the United Nations system, and Rudy Kortbech-Olesen, a senior market development adviser, gave a picture of the way it operates.

Some of the ITC's publications are valuable surveys of the markets for bee products in Europe, the United States and the whole world. The ITC also works with specific developing countries to improve their overall export performance in bee products.

Global trade and the bee world

Perhaps the most important message from IBRA's trade symposium was about the imminent freeing up of world trade, in a paper by Stephen Odgen and Murray Reid of the New Zealand Ministry of Agriculture.

The world is increasingly moving toward a more liberal trading environment. The General Agreement on Tariffs and Trade (better known as GATT) has been around since 1947 trying to regulate the international economy and prevent a recurrence of the disastrous policies of the 1930s. It has changed through a succession of "rounds," or negotiations, but the most recent set (the Uruguay round) was both long – seven years – and very radical.

GATT has gone and in its place is the World Trade Organization (WTO), but it's important to realize that the WTO is not just GATT under a new name. It subsumes the functions of GATT but goes much further in freeing up world trade in requiring member countries to remove import prohibitions and reduce import tariffs. It is also a forum for resolving trade disputes, with the aim of reducing protectionism and promoting trade liberalization.

Technical barriers

Free trade is one thing, but there are often good technical reasons to limit international movement of plant and animal products, particularly to prevent the movement of pests and diseases. The flip side of that, though, is that importing countries can hide behind technical barriers in protecting their domestic industries. The WTO has set out firm rules for technical barriers to be realistic and reasonable.

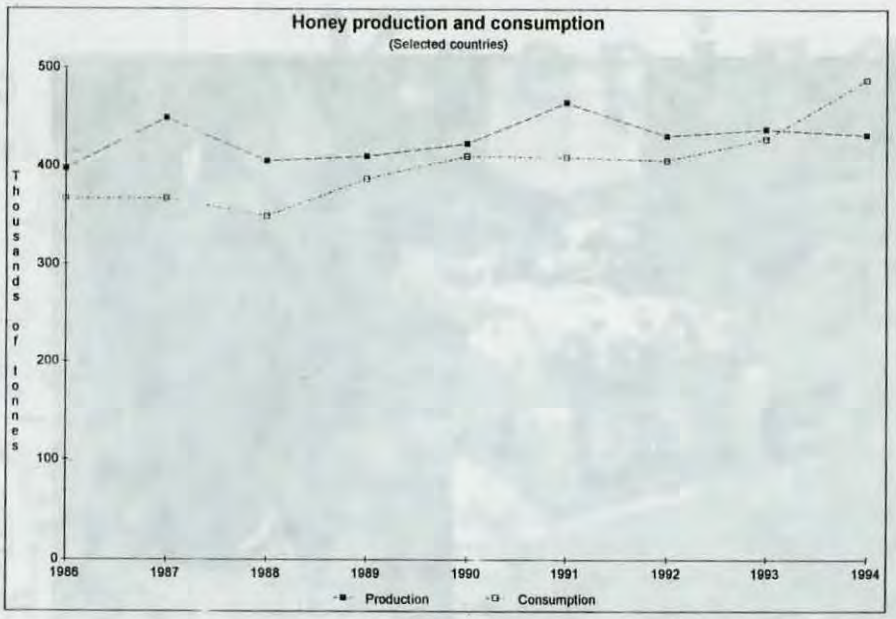
Part of the negotiations which established the WTO was an agree-

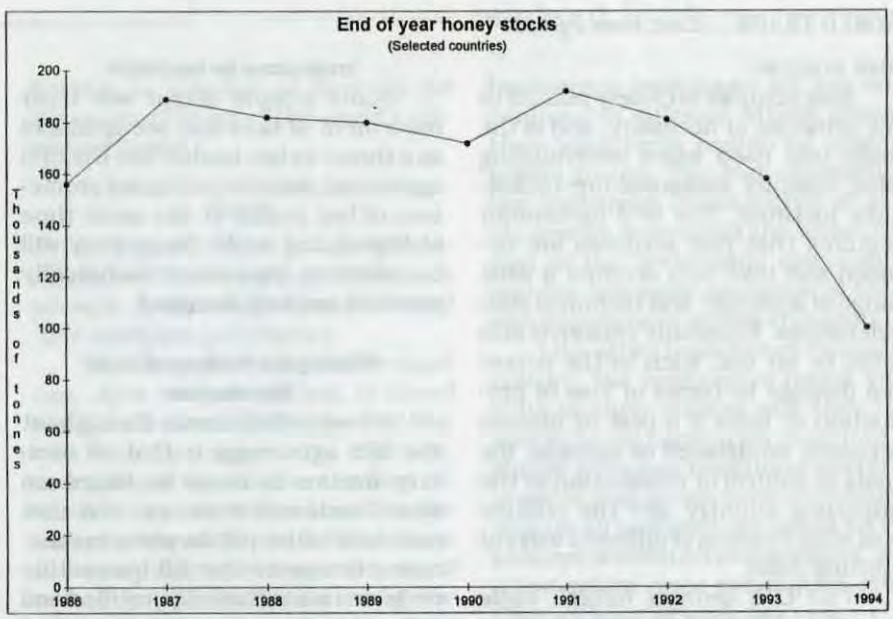
The only thing that stays the same in the live bee trade is change itself. Overnight, a political decision can close a multimillion dollar market in another country. This can happen even after the bees have been shipped, resulting in bees dying at airports waiting for an issue to be resolved. Live bees usually cannot be insured.

New markets can open up with similar speed, and to be successful, a business must be alert to possible changes and able to react swiftly to capitalize on the new demand. A smart trader has to keep informed of local political changes, of biological changes (such as movements of pests and diseases), and developments in the global trading environment.

ment on how to apply sanitary (human and animal health) and phytosanitary (plant health) measures. This is the SPS agreement, which establishes principles binding countries when deciding what conditions to impose on the importation of plant and animal products (including bees and bee products).

Implementing the SPS agreement relies on standards formulated under the auspices of international bodies such as the OIE (the world organization for animal health). The two main standards applicable to bee health are the *OIE international animal health code: mammals, birds, bees* and the *OIE manual of standards for diagnostic tests and vaccines.* These standards are now binding and enforceable under the WTO.





What's in the SPS agreement for bees?

The SPS agreement covers many different points, but there are some principles that are particularly relevant to world beekeeping. How will they work?

Necessity

The principle of necessity is perhaps the most difficult to implement. When an importer applies to import bees or bee products, how does the veterinary authority decide what bee pests and diseases it should be protecting itself against, and what level of protection it should demand?

The OIE animal health code is quite clear on this: It is "against the principles of facilitating international trade to seek guarantees of freedom from ubiquitous infections which are prevalent in the importing country." In other words, if a disease is widespread within an importing country and not being officially controlled, the importing country cannot require sanitary assurances for that pest or disease.

An excellent example of how this standard is misapplied is *Nosema apis*, found in almost all beekeeping countries and, if anyone looked, in almost all apiaries. So far as I know, this organism is not under official control in any country of the world, so there is no technical justification for requiring sanitary measures for nosema when importing bees to countries where it occurs. Despite this, some countries continue to require additional declarations such as that the bees originate from apiaries acknowledged as being free from nosema disease, and where no cases of it have been detected for a period of six months within a radius of 5 kilometers.

Equivalence

Under the principle of equivalence, an importing country cannot require an exporting country to give a specific sanitary assurance if an alternative, equivalent measure is available. This principle prevents importing countries from requiring assurances that, through their cost or level of technology, impede free trade.

Non-discrimination

An importing country must ensure that it does not arbitrarily require a higher level of assurance from one country than from another. This principle also applies to movement of bees and bee products within a country: if part of a country is substantially free from a pest and it requires sanitary assurances when importing bees or bee products from another country, the importing country must also require the same assurances and apply the same restrictions to internal movement of bees and bee products.

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Honey isn't sold only in bears and queenline bottles. Markets for honey are expanding world-wide, and with consumption up and production at best steady – prices will be volitile.

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Risk analysis

Risk analysis is closely related to the principle of necessity, and is the main tool used when determining what sanitary measures are technically justified. The SPS agreement requires that risk analyses are detailed and take into account a wide range of scientific and technical considerations. Economic concerns also must be set out, such as the potential damage in terms of loss of production or sales if a pest or disease becomes established or spreads, the costs of control or eradication in the importing country and the relative cost-effectiveness of different ways of limiting risks.

The OIE animal health code specifies the general principles and guidelines for import risk analysis. The fundamental principle is acceptance of managed risk, rather than zero risk.

Implications for bee health

Some people might see freer movement of bees and bee products as a threat to bee health, but the SPS agreement aims for continued protection of bee health at the same time as liberalizing trade. No country will be asked to abandon a technically justified sanitary standard.

Meeting the challenge of trade liberalization

A resounding theme throughout the SPS agreement is that all sanitary measures must be based on sound technical evidence, and that members must put in place mechanisms to ensure that all quarantine decisions are technically justified and defensible. Some countries may find this task daunting, but it is necessary to ensure that a lack of political will is not disguised as lack of skills or resources.

The least-developed countries may delay full implementation for five years, and other developing countries may delay for two years where implementation is prevented by a lack of technical expertise, technical infrastructure or resources; but the SPS agreement must be fully implemented by countries that are members of the WTO.

A bold future

The new World Trade Organization is open to all countries who agree to abide by the whole Uruguay round package. Unlike previous negotiations, there is no "a la carte" option for countries to pick and choose parts of the agreement – it must be all or nothing. There are also no "grandfather rights" for pre-existing GATT legislation which is inconsistent with the new principles. The clock has been set ticking for radical reform of the world trading system, and so far more than a hundred countries have signed up, representing the major proportion of world trade.

It affects us all

The world economy is based on trade, and beekeepers worldwide, whether exporters themselves or not, are affected by the global trading environment. IBRA put together this trade symposium to get key speakers to contribute on different aspects of an important issue.

Trade talks in Uruguay, honey crops in Mexico, market studies in Europe; they affect us all. We need to look over the fence at developments in other countries, as well as take lessons from people who have learned something of this mysterious craft called marketing. BC

Andrew Matheson is the director of the International Bee Research Association, working out of Cardiff in the United Kingdom. He retires the end of this month to take a position in New Zealand.

Keeping Bees In Eritrea

Eritrea, located along the Red Sea, is a tiny country in the northeastern part of the African continent which is usually referred to as the Horn of Africa, with a surface of 123,300 sq. kilometers including some 112 islands in the Red Sea. It borders with Sudan on the west and north, Ethiopia on the south and Djibouti on the southeast.

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Eritrean Beekeeping

The beginning of beekeeping was, no doubt, finding and robbing honey from wild bee colonies whenever they were encountered. The earliest evidence of honey hunting dates back to the last great ice age, between 30,000 and 9,000 B.C.

Eritrea, the biblical Land of Punt, was known as a source of gold, ivory, incense, honey and beeswax which were exported through the ancient port of Adulis.

Regarding the traditional beekeeping in Eritrea, no recorded information is available as to when and where the practice first started. It is assumed, however, that the tradition may have started more than 3,000 years ago, along with the early development of ancient civilization.

Environment

Eritrea is generally classified as arid and semiarid. Based on temperature, altitude and vegetation, the country is divided into four ecological zones: lowland, mid lowland, mid highland and highland with an average annual rainfall range between 300 and 700 millimeters (12-30 in.) in altitudes between sea level and up to 2,700M. above sea level.

The very rich floral diversity of Eritrea is mainly due to the different ecological zones that are prevalent. The country was already identified by Vavilow as a center of diversity for the origin of some of the world's cultivated crops.

Races

In Eritrea, at least two geographical races of bees are supposed to be present, *Apis mellifera scutellata* and *Apis mellifera yemenitica*.

The drought-resistant lowland bee, *Apis m. yemenitica*, is found along the hot coastline of the Red Sea, whereas the aggressive *Apis m. scutellata* is regarded as the East African honey bee and is found at altitudes between 400 and 2,700 meters. It has a high swarming rate, rapid colony development and a strong tendency to abscond and migrate. It is not known how the races are distributed within different ecological zones.

In the highlands of Eritrea, the beekeepers keep the aggressive East African honey bees mostly inside their houses or in their backyards, and the living together of people and bees is deeply rooted in their culture.

Traditional Beekeeping

Beekeeping is one of the oldest agricultural activities in Eritrea, developed and improved from generation to generation. Within the different ethnic groups, different management methods were developed according to the cultural and economic background of each group. But the beekeeping techniques are not only confined to different ethnic groups; they vary from region to region, within groups. The high standard of bee husbandry found within all ethnic groups represents the close relation of the beekeeping community and the intensive exchange of ideas and experiences within this group.

Like other branches of local agriculture, the beekeepers invest very little in their pursuit and they use very little equipment for their jobs. A simple knife and traditional beehives made of mud or cow dung are enough. Almost all methods are based on the concept of minimal management, and a bee colony does not require more than an hour of work per year.

Beekeeping is not only a source of income but also a way of life. Many have developed very intimate relationships with their bees. In the central and southern highlands, there are very many beekeepers who even have their hives inside their houses.

Colonies are found which have been in the same hive more than 30 years, and are named by the beekeeper "mother colony" from which he gets every year a certain number of swarms to replace weak colonies or to sell to neighbors.

As in many African countries, the beehives are horizontally arranged cylindrical hives made from locally available materials, but in Eritrea the

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A beekeeper is adding a honey super made of mud and dung.

A Tigre beekeeping family with a very long beehive made out of cow dung.

ERITREA ... Cont. From Pg. 685

beehives are only placed inside or near to houses and never hung up in trees. Unlike most African countries, Eritrean bee husbandry is restricted to human settlements.

Differences

In the areas of the *Bilen* people, hives are on wooden hive stands inside the *agudo* houses, and a small hole in the stone wall of the house allows bees to get out of the hive through a pipe connected to the hive. Because the hive is arranged parallel to the wall, it can be harvested from both sides. The hive is opened on one side first, and honeycombs with ripe honey are carefully cut – leaving some honey for the bees. The next time, the hive is opened on the other side to remove the honeycombs. This method guarantees renewal of fresh wax combs, which in the long run helps to produce the highest quality honey. It is a common attitude of African bees to lay eggs in new combs whereas the older, brownish ones are used for storing pollen and honey. The honey is generally harvested during the night. The *Bilen* people use honey mainly for home consumption and the remainder is used to make *birrsi*, a honey beverage for the family, or to brew *mess* for wedding ceremonies.

The *Saho* people of the southern highlands have developed their own style of keeping bees. They are renowned for their cultural relation to milk and honey, and it is said that still 30 percent of *Saho* people are making their income from beekeeping only. In earlier times, these people were more or less pastoralists. Therefore, their genuine bee husbandry represents a transitional stage of keeping bees. The beehives are mostly hollowed out large branches of *Ficus sycomorus*, placed outside their compounds along stone fences or in between the *Opuntia ficus-indica* or even in specially prepared small compounds, the so-called *Saho*-apiaries. They need to use wooden hives, often in great numbers, because the female members of the family are not involved in keeping bees and therefore clay or cow dung hives are not made by women. Many beekeepers are used to feeding their bees during times of scarcity of bee feed with sugar water. A new hive is washed with water and smoked with an herb which is called *akahe* in Sahonya. They fill the new log hives with swarms by fixing a new empty comb from a mother colony with specially prepared twigs in the newly prepared hive. Their colonies also stay many years in the same hive due to the careful removal of honey which is mostly done during the day. Most of the honey is used for home consumption but some is sold in local markets. Because of their religious background, many *Saho* people don't prepare *non*-alcoholic honey drinks because they want to avoid the fermentation of this honey water to alcohol.

The farmers of the *Tigre* people use long, cylindrical clay or cow dung hives which are generally placed outside their houses, but very often inside their compounds. Commonly the *Tigre* own only one or two hives. Very often, these beekeepers have reported that their ancestors were more often involved in honey hunting. Due to the decline of natural vegetation, they have broken with the traditions of their forefathers and have brought wild bees from the surrounding areas to their compounds. The *Tigre* beekeepers have already developed a very efficient bee husbandry, and their bees stay many years in the hives due to careful harvesting of honey, generally done at night. The honey is used for family consumption, especially for children, and the remainder is sold in local markets. Because of their religion, they only prepare non-alcoholic honey drinks.

The *Tigrigna* people have developed their own style of beekeeping which varies even from region to region and which is very similar to that of the northern Ethiopian province of Tigray. Most often, they keep their bees inside their *hidmo* houses, sometimes owning up to 20 hives. The beehives are either put in the walls of the house or placed in an inner courtyard, protected from the inquisitive glances of the outside world. In some regions, during the flowering period, honey supers are added to the horizontally arranged hives. Cylindrical cow dung hives of the same size are fixed with mud and joined up with the hives in the wall. Sometimes, a large number of colonies are found in the houses, and many of them are decorated with fine ornamental drawings. The hives inside the houses and the bees in the nearby surroundings are a familiar component of the daily lives of the people. During flowering times, the pleasant smell of ripening honey comes through the house from the hives and encourages the whole family to prepare for honey harvesting. Extreme care allows the removal of honey without destroying the colony so that honey can be harvested time and time again. When honey is harvested, all the neighbors are invited to taste it and to maintain friendships. Harvesting usually takes place at night, but some honey is also harvested during daytime. Generally, the honey is used for home

consumption, preparing honey drinks and brewing honey beer, served during weddings, funeral ceremonies and religious holidays. The remainder is sold in local markets.

Women's Role

Beekeeping in Eritrea is not only a man's business. Eritrean women are renowned for their skills in making furniture and household utensils from clay and other local materials. Therefore wives often make well-designed beehives from cow dung and clay. In most cases, the wives assist their husbands or may be assigned to carry out specific duties like catching the queen of a wild swarm and cutting her wings to prevent a newly settled colony from absconding. They may also assist in harvesting honey by carefully smoking the bees, and then provide their families with additional cash income by selling the harvested honey. Very often widows, in cooperation with neighbors, carry out small-scale beekeeping ventures to improve their livelihood.

Beekeeping Knowledge

Most of the skills and knowledge of beekeeping are transferred from one generation to the next, improved by "trial and error" and by information gathered from more successful beekeepers in the neighborhood.

The biological knowledge is confined to immediate observations and repeated experience. Eritrean culture and tradition explain the division of labor inside a hive and bee behavior, which is for most of the beekeepers, a patriarchal order. Therefore, the queen is considered to be a king and the worker bees are aggressive honey makers. Due to the round abdomen which reminds one of a traditional clay pot, the drones, called *ensarya*, are considered to be responsible for carrying water.

Advanced practical skills are widely found within the beekeeping community, however. Many beekeepers, women and men, are used to cutting part of the wings of the queen to reduce absconding. One-third of each wing is cut with a razor blade, a practice which prevents the queen from flying and the swarm has to settle near the mother colony. The wings of newly emerged queens or virgin queens are not cut – only the wings of queens in already "mature" swarms or wild colonies.

Inside a typical hive, showing new comb construction.

Generally, only sealed honey is harvested throughout Eritrea, and the beekeepers use the smoke of the wild African olive tree *Olea europaea* subsp. *cuspidata*, which develops a cool and mild smoke that will never spoil the honey. In addition, olive wood is considered to strengthen the bees and to repel pests and parasites. At lower altitudes, the smoke of the tree *Albizia amara* is used.

Beekeepers generally have extensive knowledge of herbs, shrubs and trees growing in their surroundings. They can identify most plants, giving detailed descriptions of various applications and their use for bees.

Honey Harvest

Around the time honey can be expected, a beekeeper will carefully open the rear cover lid to check the ripeness of the honey. If sealed honey is seen, harvesting takes place.

With a simple knife – the *Saho* people very often use specially prepared wooden knives – the whole cover lid is carefully removed and the mild smoke of the olive wood is driven in. This careful and purposeful smoking is necessary to drive the bees back to see "bee-free" combs. Only sealed honey combs will be removed with the knife. The beekeeper works carefully and deliberately, removing the bees from the comb with a simple grass-made bee brush or even with the fingertip. Different kinds of honey sometimes found in one colony, are sorted out. After harvesting the honey combs, the beekeeper tries to find random queen cells, also called swarm cells, and in most cases, all these cells except the two biggest ones will be squashed.

During harvesting season, it is a common practice to harvest the colonies over a fortnight to obtain small quantities of sealed honey each day. This must be seen as an exceptional cultural effort because the frequent harvesting of small amounts of honey stimulates the bees to be more active and to produce more honey.

Neighbors and relatives often will be invited to taste the honey, served with local bread or, as the *Saho* also do it, often as pure comb honey.

The annual harvest of crude honey is estimated to be five to 10 kilograms per hive (11 - 22 lbs.). Throughout the country beekeepers give this figure as their traditional honey harvest. Five kilograms are harvested during difficult times when there is not sufficient rain whereas over the last few years, up to 10 kilograms per hive were harvested.

Besides its use for cash income, honey is widely used within the Eritrean beekeeping community as a panacea for many ailments. It is generally considered to strengthen the body and to guarantee a very long life. After the birth of a baby, the mother has to eat honey for seven days to gain energy again.

Continued on Next Page

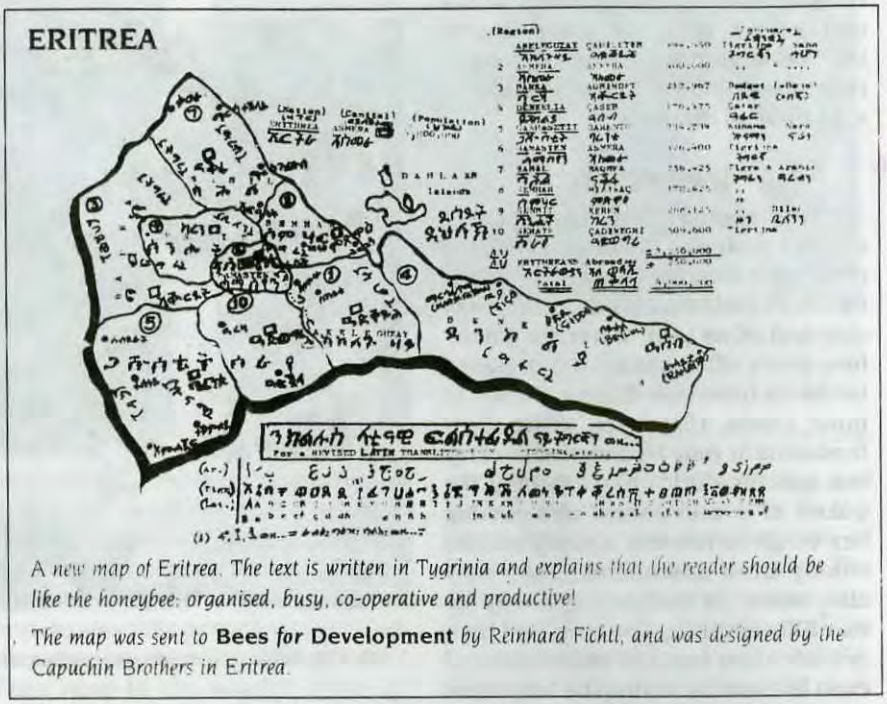
ERITREA ... Cont. From Pg. 687

Honey is used in Muslim beekeeping society as the absolutely cultural gift and for preparing the non-alcoholic beverage *birrsi* which is highly esteemed by the whole family.

Within the Christian beekeeping society, honey – besides being used in the preparation of *birrsi* – is widely used to brew the old feudal honey beer *mess*. The ingredients of *mess* are honey, sometimes small amounts of bee brood, pollen, water, dried leaves of *gesho* (*Rhamnus prinoides / Rhamnaceae*), dried bark of the roots of *tsodo* (*Rhamnus staddo / Rhamnaceae*) and the yellow spice *hurut* (*Curcuma longa / Zingiberaceae*). This honey beer has for a long time been the beverage of the central and southern highlands of Eritrea. It has been prepared since ancient times for many cultural and religious ceremonies in the houses of the social elite and of the ruling class.

In rural areas there are still many local honey beer breweries in which people gather together to maintain their social ties.

The traditional beekeeping methods of Eritrea, developed more than 3,000 years ago represent one of the oldest African beekeeping techniques south of the Sahara. It is a genuine beekeeping which involves removing of honey without destroying the colony so honey can be harvested time and time again. It also remains as a cultural heritage of the ancient civilizations of Northeast Africa. BC



A new map of Eritrea. The text is written in Tygrinia and explains that the reader should be like the honeybee: organised, busy, co-operative and productive!

The map was sent to **Bees for Development** *by Reinhard Fichtl, and was designed by the Capuchin Brothers in Eritrea.*

Reinhard Fichtl is a beekeeping advisor working in several East-Africa countries. He is presently living in Zambia.

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BEE CULTURE SURVEY - December, 1995

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Country Queens

frank fox

There's More Than Country Music In Nashville, Tennessee

Nashville, Tennessee. The name evokes thoughts of country music, the Grand Ol' Opry and...bees? The secret known only to local beekeepers up to this point is about to get out. For the past 20 years, Ed and Lacy Johnson, owners of Johnson's Honey Farm, have been turning out quality queens, packaged bees and honey products for Nashville and the surrounding area.

"My Dad raised bees," recalls Ed. "I started at an early age and kept with it. He really didn't have a very big operation. Most of his effort went into pollination and producing honey. After I took over the business, it just sort of gradually moved away into bee production."

The elder Johnson's involvement with bees began in the early 1900s. As soon as he was able, young Ed helped around the bee yard. "I had one brother and two sisters," Ed said. "But I was the only one who got interested in bees" And that involvement continued without interruption until Ed went into the army. Stationed in Oakland, California, he met his future wife, Lacy.

After a courtship lasting only a few months, they were married. When his stint in the service was over, they moved back to Goodlettsville, a small town located 10 miles north of Nashville. Lacy found herself immediately involved in beekeeping. "Nowadays, raising eight children would probably be a full-time job," laughs Lacy. "But not only did I have a job outside the home, I had to put in my time with the bees as well."

Ed and Lacy run the entire operation themselves, with Ed doing the field work and Lacy running the bee supply shop, keeping the books and doing the queen cell grafting. They both "mind the store" operating a honey stand outside their home in the traditional, unmanned honor system fashion since there are few theft problems and labor is kept to a minimum.

Since the Johnsons don't advertise, all orders are strictly by word-of-mouth from satisfied local beekeepers, testimony to the Johnsons' quality product. Every year, they are able to sell all the packages and queens they produce. Depending upon things like mites and weather, productivity can be noticeably affected. "We just take it day by day," Lacy says.

All of Johnson's bees are of the three-banded Italian variety. "I think they're the best for the area" he explains. Our winters are fairly mild, and our summers are surprisingly hot and humid. I think my three-banded Italians are as gentle as any strain I've tried through the years. They build up quickly in the spring, making them especially productive in an early nectar flow."

At the height of production, Ed will place a total of 110 nucs in two queen yards. Each year, he carefully culls through his queens to come up with new breeder stock. "I wouldn't take $400 for one of my main breeders," Ed says. "That's too small a price for a part of our future productivity."

Once his new brood queens are selected for the upcoming season, Ed then takes frames of their newly-hatched brood to Lacy, who quickly

Ed & Lacy Johnson in front of self-service honey stand.

transfers the tiny larvae, floating them in a drop of diluted royal jelly in wax queen cups attached to small wooden "bowls." Anyone who thinks this is an easy job should have the opportunity of trying it just once. They'll come away with a new appreciation for how difficult it is to transfer larvae properly!

In order to keep the larvae healthy during this process, it's important to keep them moist. During all frame transferring, a moist towel is draped over the frames. Even during grafting, a pot of water is usually boiling, ensuring the room has sufficient humidity.

Ed doesn't believe in "pushing" his starter colonies too hard. Instead of the usual 20 cells, he introduces a

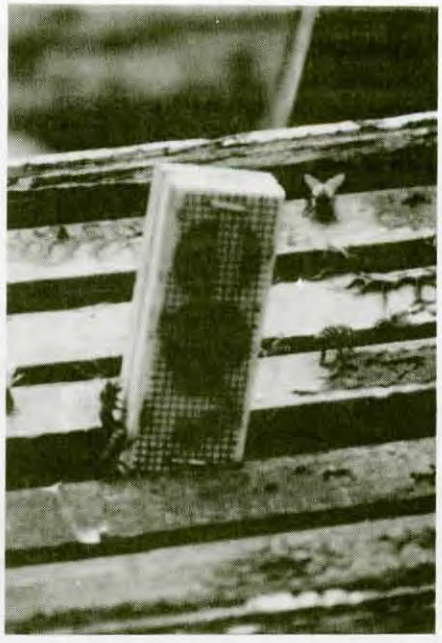
Lacy Johnson grafting queen cells.

Queen breeding apiary.

dozen or so every three days. He then pulls out the bar of twelve and puts it into a finishing colony for the next eight to 10 days. The queen cells are then scraped off the bar and placed into individual nucs, where they hatch out a couple of days later. Ten days after placing the queen cells in the nucs, they are checked to make certain the hatching was successful and that the queens have been mated and are producing an adequate supply of fertilized eggs.

"Most beekeepers don't realize the amount of work that goes into producing quality queens," Ed said. "No matter how good you think you are at this business, you never achieve anywhere near a 100 percent success rate. Between larvae not hatching, virgins not mating, queens never returning from their mating flights and other problems, some years we consider ourselves lucky to

Ed Johnson working the hives.



Queen cage being placed between two frames.

"Most beekeepers don't realize the amount of work that goes into producing quality queens."

The Johnson's carry a healthy inventory of supplies for beekeepers, including nearly everything in everyday supplies - gloves, veils, tools, smokers and the like.

. plus some of the larger requirements like extractors, tanks, bottles, pails and sugar.

turn out 60 percent of our stock. Other years, it can be somewhat higher. It's just not predictable."

If he runs low on nucs, as occasionally happens, Ed will allow several queens to hatch out in the same colony. To prevent the first queen that hatches from killing her sisters, he places each in an individual container of coiled spring. The hole in the end of the spring is covered with a small square of thin metal that slips between the coils and prevents escape.

"I bought these from A.I. Root Co. a number of years ago," Ed explains. "They don't even sell this type anymore, I'm sure. But they've never worn out, so there's no need to get a newer version of them. It takes a lot of effort to make $20 in this business, so I'm mighty careful about what I buy."

Ed cages his queens with about eight or nine attendants to make certain each queen receives enough attention. He then "banks" a number of caged queens in certain large hives. His queens are then ready for sale. And it's from these same large "bank hives" that he shakes the packages of bees.

Although queen rearing and selling continues throughout the year, the Johnsons stop selling packages by around the middle of June. The only way to get bees from them after that date is to buy a complete two-deep working hive. Ed feels that "It just puts too much strain on my colonies if I'm forcing them to constantly produce more brood, even after the major nectar flow for our area is gone."

When he's not working the bee yards, Ed is busy operating his woodworking shop to produce his hives, nucs and frames. This really is a self-sustaining business! Ed buys his sugar in bulk and also offers it for sale to local beekeepers, allowing them to take advantage of his bulk purchases, which can be up to several tons at one time.

Ed is also very active in his local beekeeping club. "Educating the public is more important today than ever before," he explained. "We need a new generation of beekeepers in this country. Feral colony populations seem to be nearly extinct now, and folks just don't realize the importance of crop pollination. It's up to us old-timers to educate and interest them in keeping bees. It's a tradition that's got to be kept alive."

And, thanks to Ed and Lacy Johnson, that tradition is continuing very nicely in Nashville, the home of country music and country queens. BC

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Goodlettsville, TN 37072-2801
Phone: 615 859-7253

Frank Fox is a free-lance writer residing in Nashville, TN. He and his wife began beekeeping last year.

OBSERVATION HIVES

dewey caron — thomas webster

Natural Hives

Up to this point we have discussed the most commonly used type of observation hive. This type allows us to see nearly all of the activities in the hive because it is only one frame thick. But we know this arrangement is quite different from a normal hive kept outdoors. Bees — and beekeepers — prefer to have their combs hang parallel to each other. With multiple, parallel sheets of comb the hive is wide enough in each dimension to allow the bees control over temperature and humidity in the nest.

What can be seen in an observation hive constructed to resemble a natural nest of bees? Are there any important advantages to using this construction rather than the standard type of observation hive? These were the questions when I was asked to help in the construction of a hive at an educational center maintained by the Kentucky Department of Fish and Wildlife.

The hive was to be installed inside an artificial sycamore tree, with glass windows on opposite sides. Two plastic tubes act as runways, running from the hive to the outdoors. An outdoor window nearby lets visitors watch the bees fly in and out. The sycamore tree was created to be remarkably lifelike, including broken limbs, lichen and a camouflaged moth resting on the bark.

To use the hollow space inside this "tree" it was necessary to get away from standard Langstroth frames. Luckily, a skilled carpenter at the center was available to make some deep, narrow frames to fit inside the hive. Only the top bars were to be the standard Langstroth width, to keep the critical "bee space" dimension between adjacent frames.

The internal dimensions are about what bees prefer in a nest site. Experiments have shown that bees hunting for a new home will choose a cavity with a volume of 10 to 100 liters. Bees in the U.S. prefer to avoid the metric system, so that's 0.35 to 3.5 cubic feet to their minds. The design we used has an internal volume of 1.66 cubic feet, right around the optimum.

Next, we had to come up with a way to make the hive removable. Occasional inspections, treatments for mites and other problems require that the hive be taken outdoors. So we made a wooden box to fit inside the sycamore tree. Glass sides on this box matched the windows in the tree. As with any observation hive, runway doors are needed to contain the bees in the hives and to keep outdoor bees outside, when the hive is moved. Our doors were made from wooden slats that slip up and down. Holes in the slats can be lined up with holes in the hives and runway, to let the bees pass. A screened hole at the top and a space of six inches above the box is for the feeder.

Installation: It's a little more work to set up this type of observation hive. Comb or foundation must be cut to fit these non-standard frames. This particular hive was to be started in late summer, so comb was cut from brood frames in an existing hive and fit into the observation hive frames. Ideally, the hive would be started in the spring when a honey flow was beginning and the bees would be eager to draw out foundation.

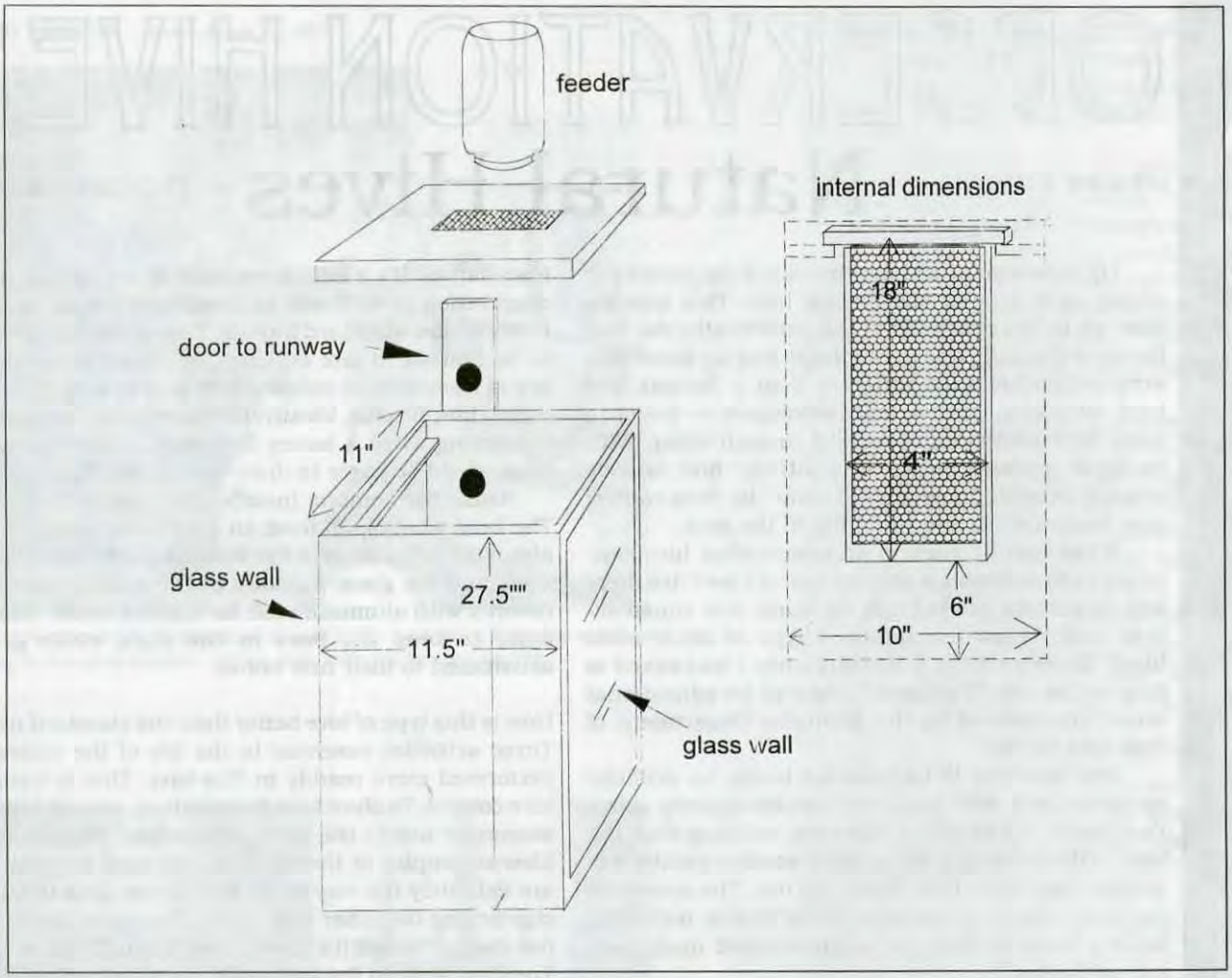
Once the comb is installed the rest is fairly easy. The bees were taken from an established outdoor hive about ten miles away. After installing the bees, the runways and the glass windows in the artificial tree were covered with aluminum foil for about a week. This was done to keep the bees in the dark while getting acustomed to their new home.

How is this type of hive better than the standard model? Three activities essential to the life of the colony are performed more readily in this hive. One is temperature control. To show hive temperature, mount two thermometers inside the hive. "Electronic" thermometers (thermocouples or thermistors) are easy to install and are definitely the way to go. One probe goes inside the cluster and the other is on one of the outer frames. Put the display where it's easy to see through the window. The difference in the temperatures gives a good idea of how the bees' metabolic activity keeps them warm. Of course, this difference will be even more significant for a hive kept outdoors.

A second behavior to look for is comb construction. The frames were deliberately made narrower and shorter than the internal dimensions of the hive. This is so that the bees building comb will be visible on the edges of the frames when the honey flow starts in spring. The new comb should cover the frames, making the nest look more like one from a bee tree.

Third, the removal of dead bees by "undertaker bees" is more conscientious than in the standard type of observation hive. Not much bee activity takes place at the bottom of the hive we show, partly because the entrance used most is near the top. But dead bees are taken out of the hive when weather permits. This is true even when the bottoms of the frames are a good six inches above the bottom of the hive.

Someone once said that every story should have a beginning, a middle and an end — but not necessarily in that order. With this in mind, we conclude our series with some of the earliest styles and modern alternative observation hives. The first record seems to be one by Pliny (23 - 79 AD), a Roman naturalist who used small windows of transparent horn to view the bees in his hive. Better hives were possible when the techniques for making high quality glass were developed in the 16th and 17th centuries.



The November 1987 issue of *Gleanings in Bee Culture* includes an article by Wyatt Magnum, on the Kenya Top Bar Hive modified for observation. Observation hives for stingless bees and bumble bees have been used extensively by researchers.

This concludes our 12-part study of observation hives. We have explored setup, operation, trouble-shooting, construction and maintenance. If you missed an article, we can supply it for you. Let us know which one, and for $3.50 (postage & copying) we will get it to you. Or, wait for the book made from this series to be released later next year. It will contain all of these articles, plus tips and tricks for fairs, booths and farm markets to enhance public appreciation, and honey sales.

If you have enjoyed this series, or have learned from it, please contact the authors directly. They have worked hard on this series, and the Publisher, and Editor are appreciative. BC

Neighbour's glass walled hive viewed from the rear with the outer cover raised.

Electronic thermometers with long cables and digital displays can be purchased from Edmund Scientific (101 East Gloucester Pike, Barrington NJ 08007-6250, ph. 509-573-6295), RadioShack, and many hardware stores. If bees add wax or propolis to the probe, it is still funtional and can be cleaned easiliy. Edmund also sells a hygrometer that displays relative humidity. However the probe to the humidity sensor must be protected from wax and propolis, or it will not work properly. Most operate on one AA battery.

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•

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ON THE HIVE & THE HONEY BEE

dana stahlman

L.L. Langstroth

Often called the Father of Modern Beekeeping, Langstroth's book is a classic, and a must read for every serious student of the craft.

Lorenzo Lorraine Langstroth is a giant in beekeeping literature. I can remember the first time I read Langstroth's *The Hive and the Honey Bee*. I finished it in two days, and it had a profound impact on me. I guess almost everyone else has had the same reaction. The tribute written by A.I. Root in the October 14, 1895, issue of *Gleanings in Bee Culture*, following Langstroth's death, shows how highly he was regarded by his contemporaries. Root wrote, "He was a wonderful talker as well as writer – one of the most genial, good-natured, benevolent men the world has ever produced." And on his book, Root wrote, "When the book was read thru once, I read it again. Then I read certain chapters over and over; and when summertime came again, then I read Langstroth's book with still more avidity and eagerness, finding new truths and suggestions in it each time."

I share A.I. Root's thoughts on the book, and I believe anyone thinking of calling himself a knowledgeable beekeeper without reading this book has, as Quinby would probably say, a rail off his fence of knowledge. There is no way I am capable of summarizing Langstroth's widom in a short article. I can only indicate in a general way some of Langstroth's topics and hope you will read this book to get the full scope and impact of what he had to say.

To begin with, the book should not be too difficult to find. It has been reprinted, and copies of the 1977 printing by the A.I. Root Company can be found in many libraries. It also shows up often in the used book market. The 1860 third edition, published by C.M. Saxton, Barket & Co., is harder to find. It has additional woodcuts and information which make that particular edition very interesting, and although Langstroth rewrote some sections, he did not make great changes in the overall message. Regardless, the 1853 edition is the one you will most likely find, and if you are lucky enough to get the revised 1860 edition, then be thankful for the additional woodcuts.

Like Quinby, Langstroth was a scientist and true observer of bee habits. Calling him a scientist is a bit risky, but he used the scientific method to observe, theorize, test the theory, and then reach conclusions. He relied on the experts of his day to verify the accuracy of his information. He also sought out literature of the time to understand the actions of honey bees. He relied on Huber for observations made with a leaf hive and was aware of the work of Dzierzon.

Dzierzon wrote a treatise on the hive and the honey bee, and as Langstroth states, "The information which it contains will be found to be greatly in advance of anything which has yet been presented to the English reader." He believed that, "A new era in beekeeping has arrived." His vision of that day was far-reaching. In addition to the body of work on the advantages of his hive, and management techniques, Langstroth included a beekeepers' calendar and some axioms which you will find interesting.

Langstroth used sugar water to calm bees rather than smoke and uses two axioms to explain why. The first was "A honey bee never volunteers an attack nor acts on the offensive when it is gorged or filled with honey," and "Bees cannot, under any circumstances, resist the temptation to fill themselves with liquid sweets." As he says, "Bees managed on this plan are always glad to see visitors, and you cannot look in upon them too often, for they expect at every call to receive a sugared treat by way of a peace offering." And for the person who uses smoke: "When the bees recover from the effects of the tobacco, they not infrequently remember, and in no very gentle way, the operator who administered the nauseous dose."

How often do we still hear that beating pots and pans will bring down a swarm of bees? "It may answer a very good purpose in amusing the children, but I believe that, so far as the bees are concerned, it is all time thrown away, and that it is not a whit more efficacious than the custom practiced by some savage tribe who, when the sun is eclipsed, imagining that it has been swallowed by an enormous dragon," he remarks.

There is no question that Langstroth was promoting his advanced hive design. The 1853 edition lists 54 reasons, and the 1860 edition has 61 reasons why his improved hive offers advantages not then possessed by other hives. The most important of these was "A good hive should give the apiarian a perfect control over all the combs, so that any of them may be taken out at pleasure, and this without cutting them or enraging the bees." And the last listed in the 1860 edition is, "A complete hive, while possessing all these requisites, should, if possible, combine them in a cheap and simple form, adapted to the wants of all who are competent to cultivate bees."

Much of the book is devoted to managing bees by "my system." His system of keeping bees is accomplished by managing them in the moveable frame hive with all the advantages it encompasses. This includes swarming and the means to create artificial swarms by multiplying the number of hives, using splits. But he warns, "I am afraid that, in spite of all that I can say, many persons, as soon as they find themselves able to multiply colonies at pleasure, will so overdo the matter as to run the risk of losing all their bees." Topics dealt with in his book include: Enemies of Bees; Loss of the Queen; Union of Stock; Transferring Bees from the Common Hive; Starting an Apiary; Robbing; Feeding; Honey; Pasturage; Overstocking a District with Bees; Anger of Bees; and Bee Dress.

And just like A.I. Root indicated many years ago, as you read it, again and again, new truths and suggestions will emerge. We can also thank Langstroth for making beekeeping less threatening and more enjoyable. He not only improved the hive and management of bees, but he also addressed the fear of the timid apiarian. He preferred to use what he called a bee-hat and suggested the use of gloves when handling bees. We have developed new management techniques which were not even dreamed of in Langstroth's day but one thing remains clear – Langstroth was a modern day beekeeper. His stature is rightly deserved, and this book should be on everyone's reading list. BC

Dana Stahlman is a retired teacher, former inspector, commercial beekeeper and avid book collector from Central Ohio.

Strictly Perennials

Easy To Grow, And Expanding Each Year, Perennials Should Be On Every Bee Garderner's List

b.a stringer

Especially for the beekeeper, whose busy season coincides with that of the gardener, perennial plants can be the backbone of a beautiful floral display throughout the season. It's an attractive proposition – plant once and see the bloom year after year with minimal maintenance! The original plants multiply and provide new "free" plants from their divisions. Let's consider a few of the hundreds of workhorse perennial plants that you can grow and enjoy for yourself and for the nectar and pollen they provide your bees.

Among these choices are plants that flower toward the end of summer, when bee forage may be less abundant than earlier in the season. Several such outstanding perennials are in the composite, or daisy family, whose blooms consist of hundreds of tiny disc flowers in the center surrounded by a ring of petal-bearing ray flowers.

Asters, particularly Michaelmas daisies, are always busy with bees during their bloom from late summer to frost. These specifically hardy asters are cultivars of the *Aster novae-belgii* group, and bear flowers in shades of red, blue and purple. Bees collect both nectar and pollen from the yellow-centered flowers which are borne in large clusters atop three to six foot tall plants. Gardeners in the hot, humid South may wish to plant the less hardy *Aster x frikartii* "wonder of staff," which bears lavender-blue flowers on two-foot stems in late summer. Asters have a clumping growth habit and need periodic division to rejuvenate the plants. In spring, dig and discard the woody center of the clump, resetting the younger offshoots from the outer edges.

Sneezeweed is the rather misleading name of another important, late-blooming composite, as it neither causes sneezing nor is it a weed. Sneezeweed's attractive red, orange, yellow and bi-colored flowers proclaim the warmth of summer from July to frost, providing valuable nectar and pollen when many other flowers are done. The plant has a reputation for imparting a bitterness to honey, but this should not be noticeable from the few plants grown in a garden, and the honey is perfectly all right for the bees' winter stores. *Helenium autumnale* grows between three and six feet tall, depending on the variety and the site. It is a vigorous plant, needing division about every two years to prevent overcrowding.

The tropical-looking flowers of the red hot poker, or torch lily, put on a show from August through September and are a source of both nectar and pollen for bees. So much nectar is produced that it drips down the long, tubular flowers and is essentially "fast food" for bees and hummingbirds, which are also regular customers at these flowers. *Kniphofia uvaria* (formerly *Tritoma*) comes in colors of red, orange and yellow, and hybrids now extend the range to include white, cream and pink. Arching mounds of long, narrow leaves remain green year-round and are topped with flower spikes in late summer. On well-drained soil, clumps may grow undisturbed for many years, increasing in size and numbers of flower stalks.

Another tall perennial is purple loosestrife, often maligned because of its successful escape from cultivation in some areas. In garden sites, the less rampant sterile hybrids display

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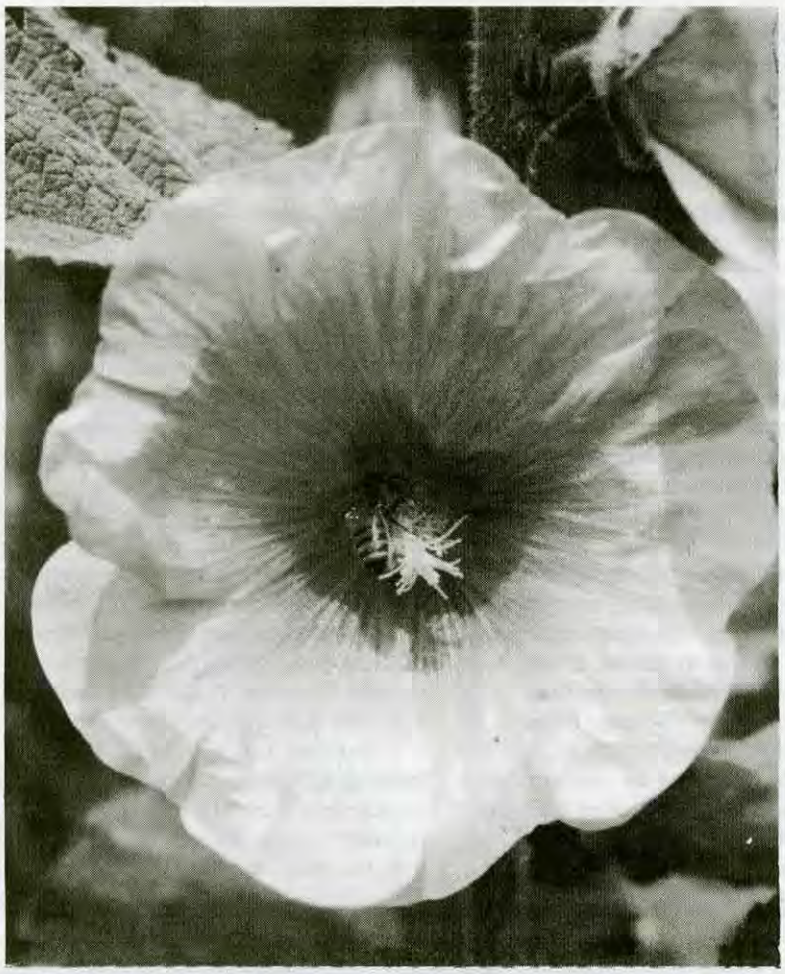
Lamb's ears have attractive, soft, fuzzy leaves, and the flowers, though nondescript, are very attractive to bees.



Hollyhocks come in a variety of colors, tolerate nearly any growing condition, and bees love them.

STRICTLY PERENNIALS ... Cont. From Pag. 699

better behavior and grow for many years before division is needed. The plants may bloom all summer, with a peak from July through September when purplish flowers cover the top quarter of four-foot-tall stems. Bees collect both nectar and pollen from these flowers. An interesting feature is that the bright green stamens are present in three distinctly different lengths in the same flower and produce three sizes of pollen grains: the longer the stamen, the larger the grain. Purple loosestrife does best in moist soils and adapts well to full sun. However, it is not a good choice for very wet areas, where it may reseed prolifically.

Easy to grow, free-flowering and attractive to bees for both nectar and pollen, the versatile bellflowers, *Campanula spp.*, include forms from low-growing creepers to erect accent plants, as well as annuals, biennials and perennials. Most have bell-shaped or star-shaped flowers in shades of blue or white. These three perennial campanulas are just a glimpse at the wide variety available. In spring to early summer, the Siberian bellflower, *Campanula poscharskyana*, is sprinkled with starry blue flowers on vigorous spreading plants. Through summer, the peach-leafed bluebell, *C. persicifolia*, produces blue, pink or white flowers atop two-foot-tall sturdy stems. Look for "Telham beauty," bearing large blue flowers, which is a choice variety for borders. The drought-resistant *C. lactiflora* grows head-high, flowering from early summer to fall with pale blue to white clusters of star-shaped flowers. Many other species, adapted to different sites, can be found at nurseries.

In bloom from mid-summer to fall, the light purple flower spikes of lamb's-ears (*Stachys byzantina*) are highly attractive to bees for nectar and pollen. The woolly white leaves, so soft to the touch, irresistible to children, are a charming contrast to some of the "hot"-colored flowers of summer. Also known as woolly Betony, lamb's-ears grow only about 12 inches tall, forming a clumping mat which drapes gracefully over a rock wall or bank. These plants need excellent drainage and will bloom best in full sun where, too, they will be most visited by bees. Big Betony (*S. grandiflora*), a taller, bushier plant bearing bright purple flower spikes in early summer, is also actively worked by honey bees.

Globe thistles, *Echinops* species, are impressive, handsome plants in the daisy family. These are the plants that excited beekeepers in the late 1800s and became known as Chapman's honey plant. They have thistle-like leaves and large, spherical, bristly flower heads in which hundreds of tiny florets bloom from mid-summer through late fall. Even when other flowers are available, Globe thistles are still well-worked by honey bees and bumble bees seeking the abundant nectar. The flowers are distinctive in the garden, with the stems reaching about four feet in height. If picked and hung to dry before they are fully open, the flowers dry well for winter arrangements. The most commonly available plants are *Echinops exaltatus*, sometimes sold as *E. ritro*, which bear steel blue flowers. You may also find "Taplow blue," a selected form with pale blue flowers. Generally easy to grow, globe thistles must have good drainage and prefer full sun. While they will withstand considerable drought once established, they fare better with adequate watering. These large plants are colorful garden companions for *Helenium* and Michaelmas daisies, which are also good bee forage plants.

A warm-toned composite with an exceptionally long bloom period, the blanket-flower (*Gaillardia grandiflora*) is a source of both nectar and pollen. Bright red, yellow and maroon flowers from June to frost adorn these easily grown plants which thrive in sun and heat and will even tolerate poor soils and some drought. Blanket-flowers, also called Indian blankets, are hardy perennials, blooming the first year from seed, forming

clumps which are useful in borders. Many strains and varieties of blanket-flowers are available, notably some with very large flowers and some dwarf plants, all of which make excellent cut flowers. "Goblin" is a compact type, easy to fit even in a small garden, with big, dark red, yellow-rimmed flowers, from which bees collect nectar and tan-yellow pollen.

Catmint and catnip are frequently interchanged common names for two species of the *Nepeta* genus, both of which secrete nectar freely and are always attractive to bees. The downy leaves of *N. cataria*, most commonly called catnip, are strongly scented and exceptionally tantalizing to cats. The flowers, white with purple spots, readily set seed which propagates the plant. This is the species endorsed by Moses Quinby, an early American beekeeper, for intensive cultivation for honey production. In comparison, catmint (*N. x faassenii*, usually sold as *N. mussinii*), does not produce seed. This low-growing plant with soft grey foliage has pale lavender flowers from spring to early summer. You can cut back the spent flowers to stimulate a second bloom cycle in late summer. Catmint is generally the preferred species for ornamental gardening because of its dense, prostrate habit and long bloom.

Russian sage, *Perovskia atriplicifolia*, is another nectar producer with silver grey foliage, which complements other grey-leafed garden plants. A native of the Himalayas, it is quite hardy and seems to do best when it has a distinct winter chill period during which it is dormant. Numerous multi-branched flowering shoots come up each season to form a mist of bloom above the foliage. An English beekeeper described Russian sage as having "masses of purple lavender-like blossoms covered with bees probing for nectar." The plant needs heat, full sun and well-drained soil and will respond with prolonged summer bloom if the old flowers are removed.

From early summer through fall, perennial *Coreopsis* species produce an abundance of golden daisy-like flowers that are an attractive source of both nectar and pollen. Commonly know by the unflattering name of tickseed, coreopsis are easy to grow in average soil and full sun, as long as the site is well-drained and adequately watered. The golden daisies of *C. lanceolata* shine all summer, frequently reseeding. By watering through dry periods and dead-heading, you can extend the bloom of this long-lived plant. Thread-leaf coreopsis, *C. verticillata*, floats pale yellow, dark-centered flowers above a bush of fine-textured foliage through summer and fall. The selection "moonbeam" is drought-tolerant and low maintenance, and more adapted to warmer areas.

The sterile hybrids of common purple loosestrife come in several colors and are still attractive. They either don't spread, or do so very slowly, and don't produce seed.

Hollyhocks (*Alcea rosea*) are tall, stately flowers that have been popular in cottage gardens for centuries. The older varieties are all single-flowered, growing as tall as nine feet, while newer strains have been bred shorter and for doubled flowers. Hollyhock pollen is very attractive to honey bees, as you may see two or three bees in a single flower gathering the large-grained white pollen as soon as it is released. Some nectar is also produced by the flowers and collected by bees. Native to China, hollyhocks are hardy, short-lived perennials which reseed themselves and can be easily grown from seed in a wide range of soils. The silky flowers are large and open, carried on tall spires through summer and fall. Some of the colors for the single-flowered kinds include shades of pink, red, purple, cream and white, and there is one old variety which is almost black. These plants thrive in full sun with good ventilation around the leaves to prevent rust fungus infestation. Admirable and elegant in the back of the border or along a fence, Hollyhocks are charming and useful in your flower beds.

These and many other perennials are indispensable additions to beescapes. They furnish nectar and pollen for the bees, and they gladden the eye and refresh the soul. Perennials are an investment that returns interest year after year in the garden. BC

B.A. Stringer grows perennials, as well as many other bee plants around her home in Oregon. She is a freelance writer and regular honey plant contributor to Bee Culture.

HOME HARMONY

ann harman

Chilly Weather Drinks

Chilly weather has crept over much of the country. And we are in the middle of the Holiday Season. (Winter, a "fifth season," comes after New Year's.) This is the perfect time for a warm drink, one made with honey, of course. Since the Holiday Season is a time for friends and family gatherings, we have included some recipes for large quantities of these delicious warm drinks. At other times, a small recipe is more suitable for a quiet moment before the fireplace.

Generally, a mild honey is best in a beverage, but you can certainly experiment with a distinctively flavored honey. Try such a honey out on yourself and your family first before serving it to guests. Since you are fixing a hot drink, the honey will dissolve readily. If you have a favorite recipe that calls for sugar, just substitute honey – you will be pleasantly surprised by the enhanced flavor.

GET TOGETHER EGGNOG

A traditional Holiday Season drink is eggnog. Actually, a well-prepared eggnog is so delicious that I wonder why we only think of it during Holiday Season. Let's try serving it during the "winter season."

12 egg yolks
12 egg whites
2 quarts real whipping cream
3/4 cup honey (use a dark, full-bodied variety)
5 cups rum
nutmeg

Separate eggs and beat the yolks until light. Beat in honey gradually. Slowly add 2 cups rum while beating. Let mixture stand covered for one full hour to get rid of the "eggy" taste. Then, beating constantly, add the rest of the rum and the 2 quarts of whipping cream. Refrigerate for 3 hours. Then, beat egg whites until stiff and gently fold into the refrigerated mixture. Serve with nutmeg sprinkled on top. Serves 20.

A Honey Cookbook
A. I. Root Company

HONEY KRAMBAMBULI (Punch)

Watch your eyebrows when mixing up this one! You can mix this hot punch in front of your guests for a dramatic touch.

1 quart dry white wine
1/4 cup orange juice
1 tablespoon lemon juice
1 stick cinnamon
1 lemon, quartered
1 orange, quartered
2 cloves
1/3 cup rum
1/4 cup honey

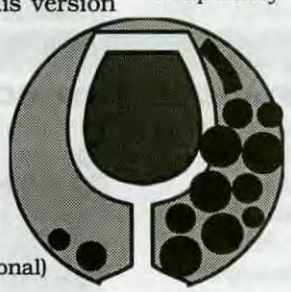
Combine the first 7 ingredients in a large pan; bring to a simmer over medium heat; reduce heat and continue to simmer for 8 minutes. Strain into punch bowl. Pour the honey into an earthenware bowl. Place the rum in a ladle and light the rum with a long match; pour over the honey, which will caramelize lightly. Add to the wine mixture and mix with the ladle. Makes approximately 1 quart.

The Book Of Honey
Claude Francis & Fernande Gontier

MULLED WINE

A hot, spiced wine drink for a cold winter day has been popular for hundreds of years. Try this version with honey.

4 cups claret
2 cups water
1 thinly sliced lemon
6 cloves
4 berries allspice
2 sticks cinnamon
2 cups honey
2 teaspoons poppy seed (optional)



Boil all together for a few seconds. Strain into warmed mugs. Drink piping hot.

The Honey Cookbook
Juliette Elkon

HOT BUTTERED RUM

Hot buttered rum is a treat when made with honey. This recipe is a useful one since you can make just one mug or enough for friends.

3/4 cup honey
1/2 cup butter
1/4 teaspoon finely shredded lemon peel
1/4 teaspoon ground cinnamon
1/4 teaspoon ground allspice
rum
boiling water

In a small mixing bowl, combine honey, butter, lemon peel, cinnamon and allspice. Beat until well-combined. Use immediately or cover and chill up to one month. Makes about 1 cup or enough for 10 (about 6-ounce) servings.

For one serving: Place one rounded tablespoon of the butter mixture in a mug. Add 3 tablespoons rum and 1/2 cup boiling water. Stir well.

Better Homes And Gardens New Cookbook

HOLIDAY WASSAIL

Here's a good recipe for a large party since it will make 45 to 50 servings of 1/2 cup apiece.

4 cups orange juice
16 cups apple juice
1 cup honey
2 cups whiskey, rum or brandy (optional)
1 tablespoon whole allspice
3 medium oranges
1 tablespoon whole cloves

In a large pot, combine fruit juices and honey. Add liquor if desired. Tie the allspice in cheesecloth and add to juices. Press 1/

Continued on Next Page

HOME ... Cont. From Pg. 703

3 of the cloves into each orange. Add to juices. Simmer – do not boil, especially if you have added liquor – covered for 20 to 30 minutes. Remove allspice. Pour into heated punch bowl, floating orange on top. Ladle into mugs or punch cups.

A Honey Of A Cookbook
Alberta Beekeepers Association

HONEY GROG

Now for a smaller amount. This next recipe will make 8 servings.

4 cups apple cider or apple juice
juice of 1 orange
1/4 cup honey
2 tablespoons butter or margarine
1 cinnamon stick 3 inches long
1 teaspoon grated orange peel
1/4 teaspoon ground nutmeg
1/2 to 3/4 cup light rum (optional)

Combine all ingredients except rum in medium saucepan and bring to a simmer, stirring occasionally. Simmer 5 minutes. Stir in rum just before serving.

Sweetened With Honey
National Honey Board

ANTIGUA RUM SAUCE

Although ice cream is eaten the year around, a nice warm sauce makes a good cold weather sundae.

1 cup honey
1-1/2 cups hot water
2 tablespoons instant coffee
2 tablespoons arrowroot
2 tablespoons cold water
2 tablespoons butter
1/4 cup dark rum.

Combine hot water and instant coffee. Pour over honey and stir, while heating gently. Mix arrowroot with cold water. Stir into sauce. Continue cooking, stirring constantly, until sauce is thickened and smooth. Add butter and rum. Stir until butter is melted. Serve warm over ice cream. Makes 2 cups.

The Spice Islands Cookbook

Don't forget to leave a cup of eggnog and some honey cookies for Santa Claus. The reindeer might appreciate a honey granola bar. BC

and genetics. For her efforts in research and teaching (she taught several biology and some entomology classes) she was able to finish the courses needed and to live in relative comfort (a roof and meals). When done, she would have a Ph.D. degree in entomology, and the chance to do that which she had started over 10 years ago.

Diana, if you don't recognize the name right off, is Diana Sammataro, and is the principle author, with Al Avitabile, of probably the best book on how-to beekeeping I know of. Entitled *The Beekeeper's Handbook*, it is one of the best (if you can find one, because they are out of print). They managed to help train literally thousands of people in how to keep bees.

If that weren't enough, during her stay at school, she managed to get two or three articles published in magazines just like this one (exactly like this one, actually), on what she was doing, how things were going, and what people could do with what she had found out. Grease patty research began to pay off fast when those numbers came in.

The first story on mite resistance to fluvalinate was generated by three people at a conference on mites and bees, all students or researchers with nothing to gain, except getting the information to the people who could use it. Have you heard much on mite resistance in the last few months? Thank Evan Sudgen, Christina Williams and Diana.

Well, she's finished. All the classes. All the articles. All the teaching. All the work. All the stuff and nonsense needed to be a Ph.D. And, there's even a job on the horizon. A postdoc position continuing her studies of tracheal mite biology and control, along with *Varroa* mite control. She may even solve these puzzles once and for all.

And, in her now ample spare time, she is rewriting her book for a new and enlarged third edition, to be ready sometime soon (I could not get a good definition of soon, however).

Anyway, my point is that some academic types can, and do, make good on their debt to the people who made it possible. This is one.

Congratulations Diana. You studied hard, you did well, and you have made me, and all of us proud.

Kim Flottum

Federation Meets In Portland, Oregon

The American Beekeeping Federation's annual convention, scheduled for Jan. 16-22, 1996 in Portland, OR, will include all the customary ABF activities, but it will have some different features as well.

The most obvious change to the attendees will be the emphasis on the ABF Trade Show, where two sections of each day's program will be in the exhibit hall. The mid-morning and mid-afternoon breaks and refreshments will be set up among the Trade Show exhibits.

Vendor 'show and tell' sessions are scheduled, along with talks on parasitic mites and Africanized bees, honey marketing and promotion, bee breeding and beeswax usage, computers in beekeeping and honey exporting tips, even bee photography and collecting bee memorabilia.

On the lighter side will be a much-expanded silent auction and a beer-tasting outing. It will include visits to two micro-breweries and will feature dinner and a tour of Portland Brewing Co.

Sunday is for optional tours. One up the slopes of Mt. Hood with an opportunity to ski, the other through the Coastal Mountain range and along the rugged Oregon coastline to the Oregon Coast Aquarium.

For registration information write the ABF Office, P.O. Box 1038, Jesup, GA 31598 for a copy, or call or fax 912-427-8447 for the information packet.

Hotel reservations at the Red Lion-Lloyd Center can be made by calling 503-281-6111; be sure to identify yourself with the ABF. Discount airfares are available on United and Southwest airlines through Conventions in America; call 1-800-929-4242, ask for Group #416, or ask your travel agent to call the airlines direct – United, Tour Code #588BP; Southwest, ID #N8736. Alamo is the official car rental agency; call 1-800-732-3232 and ask for ID #423160, Rate Code GR.

For more information contact the ABF at (912) 427-8447

APIARY INSPECTORS & NATIONAL HONEY PACKERS & DEALERS MEET IN PORTLAND, OREGON JAN. 16-22, 1996

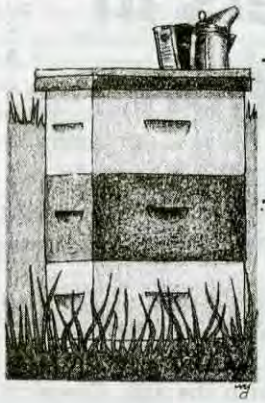
Honey Producers Meet In Corpus Christi, Texas

The American Honey Producers will hold their annual meeting in Corpus Christi, TX, Jan. 9-13, 1996 at the Marriot Bayfront Hotel, 900 N. Shoreline Blvd. (call 800-874-4585 for reservations). Special events include trips to the Weslaco Bee Lab and The TX State Aquarium, plus the regular reception and banquet.

Topics to be covered include TX beekeeping, The Weslaco Lab, marketing and commercial sales, pollen sales and selling bees and presentations by the National Honey Board; USDA research – including reports from every bee lab; plus economics and honey plants. Workshops on Saturday include mite biology and control – PMS, pesticide resistance, grooming behavior and IPM management. The second workshop covers the expanding role of women in beekeeping; plus BVT beeswax how-to and the business meeting.

A large trade show is on site, plus plenty of outside activity in the city by the gulf.

Registration information can be obtained by calling AHP, 203-250-7271.



BEE TALK

richard taylor

"Every colony was in decline and survival of many is doubtful."

It's time for some serious talk about *Varroa* - once again. Indeed, I think 1995 might go down in the memories of beekeepers as the year we got hit by *Varroa*. It's not that this parasitic mite is something brand new to us, but its devastation is unprecedented, at least in the areas I know something about.

Anyone who read my comments last month may recall my exultation over the strength of my colonies. I had never seen them so strong in September. Supers had gotten filled in record time, even in August, when I normally expect to get little honey. Bees were clustered all over the fronts of the hives, even on cool days, they were so populous. Normally, I do not do any supering after early August, but merely let the bees complete any partially filled supers still on the hives. This year, however, even in September, I was considering adding more supers. The weather was warm, the goldenrod looked good, and the bees were obviously in condition to make honey. I had already harvested the biggest crop of comb honey of my life, and my spirits were high. But something told me not to add more supers. Years of experience with fall flows had taught me that it is not a good idea, at least for getting comb honey, so, the general feel of things, notwithstanding I didn't. There were just a few unfinished supers here and there, so I decided to wait and see what happened to those.

Well! In mid-October, I went back to my yards to see about making some winter preparations, and I was appalled. Every colony was clearly in decline. The populations of about half of them were so low that their survival is very doubtful, and one was empty of bees altogether. *Varroa* had hit me with unbelievable swiftness and strength.

I'm not alone in this. I've been getting similar reports from all over. A reliable and trusted friend from Ohio estimated that half the colonies in that state are dead. Another, who has even wider knowledge of conditions there, put the figure at about 80 percent. It seems, from what I can gather, to be the story all over the East.

What happened, of course, is that as the brood rearing declined, the mite population on adult bees increased rapidly, and these two factors working together made every colony vulnerable. Why it happened this year, and not last year, I do not know.

There is, I think, an obvious lesson in this. What we've got to do is get our Apistan strips in sooner. I think beekeepers are going to have to get their honey all harvested sooner - perhaps by mid-August up where I live, earlier down south – and then treat their hives with Apistan right away. The days of finishing the honey harvest in November may be over. This is, of course, not bad, according to my ideas of management. I have long advocated letting the bees have the entire fall flow for wintering, as this makes for much stronger colonies in the spring, when strong colonies are especially needed. Indeed, such a schedule, of early harvest and early treatment for mites, works perfectly for a comb honey beekeeper like myself.

One thing that does bother me is our complete dependence, right now, on Apistan. Sooner or later, the mites will become resistant to it, and aside from this, it is obviously not good for beekeepers everywhere to be so dependent, just for survival, upon one man-made substance. The history of mankind's attempts to control pests with chemicals is not encouraging.

But there are some promising signs. Other treatment methods are being developed and will, in time, become available. I've been learning about these, but it would be premature to go into all that now. And someday, no doubt, we'll have bees that can naturally cope with *Varroa*, just as Africanized bees seem to do already.

Now something should be said about the use of Apistan. You need at least two strips per colony, perhaps more, depending on the colony strength (the label says one strip for every five frames of bees). The point is to get the strips into the part of the hive where the bees cluster. The bees must come in contact with them. For a weak colony, this means inserting the strips fairly close together - separated by only one or two combs, for instance. And there is no point placing strips in any part of the hive that is virtually empty of bees. The directions tell you how many strips to use per story and just which frames to insert them between, but you must modify that sometimes in the light of colony strength and where the bees actually are in the hive. It is, however, essential to insert the strips between combs, and not just lay them over the top bars because, once again, actual and continuous contact with the strips is essential.

Contrary to what many beekeepers believe, Apistan strips are not impregnated with the active acaracide, fluvalinate. It is a surface coating. So the practice of some beekeepers, of

sanding and scoring the surfaces to release more fluvalinate from strips that have already been used, is pointless. The acaracide does not migrate to the surface from within the strip. It is already on the surface, and when it is gone, or more or less gone, the strips are of no use.

Apistan strips are most effective when first inserted in the hives, and their strength begins to decrease very rapidly. After about eight weeks or so, their effectiveness is virtually gone. Hence, the practice of some beekeepers, of leaving them in the hives all winter, is not only contrary to directions, and hence, contrary to law, but it is also pointless. Another practice some beekeepers have adopted of saving the strips after they have done their job, wrapping them in foil and using them again the next year, is also pointless. The life of an Apistan strip is simply the time it takes for the surface ingredient to get rubbed off, or reduced to a point of ineffectiveness.

Should we be discouraged? I don't think so. Honey bees have been here for 30 million years, predating the rise of the human race, and they will probably still be here after the human race has disappeared. As for the immediate future, we just have to adapt our management practices to the circumstances. We've got to get our crops harvested early - which is a good idea, quite apart from *Varroa* and treat the colonies at once. I think we are also going to need to test for these mites in the Spring and perhaps treat the colonies then, too, before the honey supers go on.

And in general, when I think about the rise and rapid spread of parasitic mites, I also reflect on the fact that, over the past several years, I have gotten the biggest honey crops of all my many years of beekeeping. That in itself is enough to give me a good deal of faith in the future. BC

Richard Taylor is a philosopher and lifelong beekeeper who lives in the Finger Lakes region of New York.

Questions?

On, or Off

Q **I have two hives, each with a shallow super over the single-story hive and a queen excluder in between. Should I leave the excluder there all winter? If I remove it, will the queen go up and lay eggs in the supers?**

Arthur Shick
Sharon Center, OH

A I think there would be no harm in leaving the excluder there. Some might suggest that the bees could cluster above it, abandoning the queen below, but I doubt this would happen unless they run out o fhoney completely below. On the other hand, it would do no great harm if the bees raised brood in the super, assuming it is not a comb honey super. They would eventually refill it with honey, after the brood hatched out.

Stress

Q **What are the main causes of stress in a colony and what are its consequences?**

Anas Dughman
Benghazi, Libya

A I do not know what would cause stress in Libya, but in general, stress is thought of as any environmental condition that absorbs the energy of a colony and makes it difficult for the bees to carry on normal activities of reproduction, foraging and so on. Here, those conditions include unremitting wind, constant dampness, repeated invasion by predators and diseases, disorientation from moving, beekeeper harassment, food or water shortage, heat, cold and so on.

Drone Comb

Q **A speaker at our bee meeting said that *Varroa* could be controlled by using drone foundation in the brood chamber. Is this effective? Would it eliminate the need for Apistan? How often would the drone foundation need to be replaced in the brood chamber?**

George Piper
Torrington, CT

A It is known that these mites show a preference for drone brood, and some bee experts have suggested taking advantage of this, but I do not know how effective it is as a control measure. I'm sure many readers would appreciate knowing about any tests that have been done, and I will welcome responses on this.

Editor's Note: Recent studies by USDA scientists indicate that both drone puape and drone comb are attractive to *Varroa*. Placing drone comb in a colony would certainly act as a magnet for some, perhaps many, female mites looking for a warm and cozy cell. Replacement would be required before capped brood emerged, a timing thing you'll need to figure out. Once removed, an evening or two in the freezer to kill brood and mites, and back in the colony for another round.

Allergic?

Q **Six years ago, I got stung on my lower arm, and it swelled so bad I went to a doctor, who said I was allergic to bees and should find a different hobby. Since then, I have been stung many times, but with little swelling. What's the explanation?**

Charles Walli
Marengo, IL

A I'm afraid your physician did not know what he was talking about. Local swelling, in the area of a sting, is not an allergic reaction, even when the swelling is very great. Most beekeepers, like you, develop a tolerance for stings such that, while they always hurt, they eventually produce little or no swelling, even when received on the lip, ear or similarly sensitive area. It is only when the reaction to a sting is general or "systemic," that is, all over the body, in the form of "hives" or welts, or worse together with general discomfort, that you have an allergic reaction. This is relatively rare, though it can be dangerous.

Creamed Honey

Q **I have a friend who, for 28 years, has made creamed honey in the fall without heating or whipping it, but this year, it just granulated as coarse crystals. How come?**

Charles Walli
Marengo, IL

A To make creamed honey, you must start with a honey that crystallizes very fast, like goldenrod or aster. When crystallization is slow, as in the case of honey that has been heated, or with certain honeys such as basswood, then the crystals are large and coarse. The same happens with honey that contains honey dew. Fine crystallization is also hastened by thoroughly mixing in a small amount of finely granulated or "creamed" honey, a process which is called "seeding."

Honey Dew

Q **What is "aphis honey?"**

NO NAME OR ADDRESS

A That is another term for honey dew, that is, for honey derived from the sweet exudations on the leaves of certain plants. The term comes from the belief, which I consider to be mostly a mistaken one, that bees gather this sweet, sap-like exudation directly from aphids feeding on such plants. It is no doubt true that, at least in some parts of the world, this sometimes happens, but I have never seen a bee foraging on a plant infested with aphids, nor have I ever found anyone who has. What sometimes happens is that, when nectar is scarce, the bees gather sticky sap from the surfaces of the leaves of trees, and this ends up in the hive as honey dew. It is invariably dark and often quite strong-flavored.

Editor's Note: The sources of these sweet exudations is at the heart of this question. While you may never see a bee and an aphid actually 'sharing' this material, you may, with luck, note that the exudate is deposited on leaves to be collected later by bees. Of course there are other insects that feed, and produce, in a similar manner leaf hoppers, scale, plant hoppers, mealy bugs and the like. However, another theroy is that some environmental situation heat and drought stress, drought only, heat only, or something similar - may cause plants to spontaneoulsy produce and secrete a nectar-like substance collected by bees. There's reason to believe this, too, may contribute to honey dew production.

Races of Bees

Q I am curious about the different races of bees. Are some better than others? Is there an advantage to having different races and hybrids?

Andy Moore
Sweetwater, TX

A There is no doubt that some queen breeders offer bees that produce better than others and some queens, such as the Buckfast queens, seem to be more resistant to tracheal mites, but I am convinced that what kind of bees you have is of secondary importance. What is important is how you manage your apiary. A good strong colony makes a good crop, whatever the race or strain might be.

Ventilation

Q Is it a good idea to have a hole drilled in the upper hive body as an upper entrance? It seems to me this would let a lot of cold air into the hive. If I keep the entrances of the hives clear of snow, can I not plug any upper entrance holes?

Peter Bohman
Cumberland, ME

A There are several misconceptions here. First, it is important to have ventilation of the hive in winter because the buildup of moisture puts far more stress on the colony than cold does. But the best way to get good ventilation is to leave the hole in the inner cover partly open so moisture can escape without wind blowing in. Second, it does the bees no harm to have the hive entrances obstructed by snow, or even for the hives to become buried in snow, provided they are tilted forward slightly so that melting snow does not flow into the hives. And third, even severe cold is not very stressful to bees, provided other stressful conditions, such as dampness or wind, are not present.

Late Laying

Q Is there any way to get the queen to restrict her egg laying in the fall so that the colony will not have such a large population consuming winter stores?

NO NAME OR ADDRESS

A The queens of some races of bees are thought to be less prolific than others in the fall, and some beekeepers have considered this to be an advantage so far as wintering is concerned. But I believe this might rest partly on a misconception. The consumption of winter stores is not very great, even with a populous colony, until the queen resumes egg laying in the early spring. My own belief is that a colony should be strong even in winter, as a large cluster will winter better and, given plenty of stores, the colony will be strong in the spring when populous colonies are what you need to take advantage of the sometimes heavy spring nectar flows. Weak colonies only manage to build up on these spring flows rather than storing surplus honey. If the colony is populous in the fall, and the combs are fairly filled with honey, then this will restrict autumn egg laying to some extent, just by lack of much space for eggs. But then that abundance of winter stores will ensure a rapid buildup in the spring, even before the first nectar flows, and you'll be off to a good harvest.

Editor's Note: Weak and small are not synoymous. A queen that quits laying early in the fall, and starts laying late in the spring may be just what your environment requires. The key is to know what the avilable forage is, and select your bees to accommodate that schedule. A strong colony, when needed, is important. A small colony, when needed is important, too.

Winter Weight

Q Do you weigh or estimate the weights of your hives going into winter? What would be an adequate weight? What is the average consumption of a colony?

F. B. Wardwell
Prospect, ME

A The heavier a hive is in the fall, the stronger it will be in the spring and, hence, the better your honey crop. Stores should not be merely adequate to get the colony through winter alive. I never weigh my hives, and I never feed them, with but few exceptions. I like to find all my hives very heavy as they go into winter, as if filled with rocks. Winter stores are never wasted.

Questions should be sent, together with a stamped, addressed envelope, to Dr. Richard Taylor, Box 352, Interlaken, New York 14847, and not to Medina.

Answers!

Richard Taylor

?Do You Know? Answers

1. **True** Visual perception occurs through two different types of eyes. All three castes of honey bees have compound and simple eyes. Both the size of the compound eye and the position of the simple eyes varies with caste.
2. **True** The proboscis has the primary function of ingestion of liquid materials. Tastes are detected by the sensilla (sensory structures) that are situated on the structures which come together to form the sucking tube or proboscis.
3. **True** Most of the sensory nerves of the exoskeleton end in cells at the bases of hairs. The hairs, being delicately poised are easily moved by contact with objects or currents of air. These innervated hairs and associated sense cells constitute organs of touch.
4. **True** An ocellus or simple eye consists of a lens above a layer of very simple, elongated retinal cells connected to nerve fibers. No image can be formed on the bee's retina and it is assumed that its only function can be to detect the relative intensity of light.
5. **False** On the antennae, seven different types of sensory receptors have been found. These sensory organs (sensilla) are not equally distributed on the antennae. Sense receptors are not found on the long basal stalk of the antenna or on the first three segments of its flexible distal part, which is called the flagellum. The sensory receptors are confined to the eight outer or distal segments of the flagellum.
6. **False** Bees are blind to red; however, bees react strongly tosome red flowers because these reflect ultraviolet rays, which are attractive to bees. Red flowers without ultraviolet reflections appear as black to bees.
7 **False** Compound eyes can perceive airflow using sensory hairs arranged at the junctions of the facets (ommatidia). When these hairs are removed, workers lose their ability to find their way to accustomed feeding sites under windy conditions, presumably because they can no longer compensate for wind speed during flight.
8. **True** Bees use their paired antennae to detect accurately the direction of an odor by comparing the intensity of odorant molecules perceived by each antenna.
9. **True** Honey bees are able to see the sun directly through the clouds even when it is not visible to our eyes. They use ultraviolet light waves rather than those in the visible spectrum to sense the position of the sun. Ultraviolet waves penetrate through overcast skies, and workers use these waves to locate the position of the sun.
10. **False** The antennae of the worker and queen each have 12 segments and the drone has 13. The antennae of the drone are also longer and broader than these of the workers.
11. D) Sucrose
12. B) Drone, Worker, Queen
13. Quacking is produced by the young queen still confined in her queen cell. Tooting is produced by a young queen that is free on the combs within the colony.
14. Touch, Taste, Smell
15. Antennae
16. Three
17. Drone
18. Forming images
    Color vision
    Perceiving the plane of light polarization
    Head turning responses
    Detecting movement
    Recognizing shapes and patterns
    Detecting differences in light intensity
19. A) Drone B) Worker

There were a possible 25 points 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

Gleanings

DECEMBER, 1995 • ALL THE NEWS THAT FITS

AGRICULTURAL TRANSPORTERS UNITE

The seeds of a new dynamic organization to represent agricultural transporters were firmly rooted on September 27, 1995, when truck operators from around the country met in Dallas, TX, to form an Agricultural Transporters Conference (ATC) as part of the American Trucking Associations (ATA).

The conference will join with 12 other national industry groups and 51 state trucking associations (including the District of Columbia) as part of ATA's family of organizations. ATC will be managed and staffed by ATA.

At the Dallas meeting, the group adopted its organizational bylaws, elected officers and a board of directors, and established a regional structure and natural divisions to represent the various segments of the agricultural transportation industry. Those named as officers were:

Chairman - Bud Wallace, Wallace Transportation, Planada, CA.

Vice Chairman - Lester Coggins, Jr., Lester Coggins Trucking, Okahumpka, FL.

Secretary Ed Rocha, Ed Rocha Transportation, Modesto, CA.

Treasurer Charles Whittington, Grammer Industries, Grammer, IN.

Elected to the Board of Directors were: John Teresi, Teresi Trucking, Lodi, CA; Rodney Rodriguez, Rodney Rodriguez Trucking, Powell, WY; Vic Sward, Sward Trucking, Oakdale, CA; Bill Barbieux, Inland Fruit Co., Ft. Pierce, FL; and Ed Walpole, Walpole, Inc., Okeechobee City, FL.

The divisions and the appointed representative are: Forest – Joe Young, Low Country Forest Products, Inc., Georgetown, SC; **Livestock (including bees) – Richard Gripp, Plains Transport, Amarillo, TX;** Product Preservation – John Schiro, Tri Valley Growers, Inc., Modesto, CA; and Allied Industry – Jerry Whitehead, Western Trailers, Boise, ID. Hal Beeler, Kings County Truck Lines, Tulare, CA was appointed representative of the Western Region. Representatives of two divisions, General Agriculture and Earth & Mineral, have yet to be appointed.

For details on ATC and membership information contact Paul Stalknecht, ATA Senior Vice Pres. – Fed. Relations at 703-838-1803.

BILL TO ELIMINATE USDA

Sen. Frank Pallone (D., NJ), and Rep. Donald Payne (D., NJ) introduced legislation to "eliminate the Department of Agriculture" as an attempt to "level the playing field in deficit reduction." "The Agriculture Modernization Act of 1995" would abolish certain agriculture programs or transfer certain functions of USDA to other federal agencies. For instance, most likely, the Animal & Plant Health Inspection Service (APHIS) would be placed under the Department of Health & Human Services. The bills were introduced after similar legislation to eliminate the Departments of Housing & Urban Development and Education were introduced as a means of controlling the deficit.

IBRA STRIKES GOLD

Beekeepers can get high quality information from the International Bee Research Association; that's the message from the latest international beekeeping congress in Lausanne, Switzerland.

In the competition held at this recent congress, IBRA's two entries both won medals in the category for instructional material.

A colour guide to the pollen loads of the honey bee by William Kirk took the only gold medal for this type of entry. "We've been pleased with this book ever since it was published last year," reported Andrew Matheson, the Director of IBRA who collected the medal at the congress. "The high sales figures have proved its popularity with beekeepers everywhere."

This exciting and practical manual contains over 500 colour samples, and describes (in English, French and German) the pollens of 268 species. While these are all European species, many are common in other parts of the world.

It builds on Dorothy Hodges' classic work, but goes far beyond it in the number of species covered and the accuracy achieved with modern printing processes.

The other medal won by IBRA was the bronze, awarded to *New Perspective on Varroa*, edited by Andrew Matheson. The chapters in this book (also published last year), give a wide-ranging look at *Varroa* in Europe. Four review papers look at important issues, while 25 papers in five sections review current research on this parasite. Many techniques and issues thought elsewhere to be new are more well known in Europe, and are described in this book.

These awards follow IBRA's success at the previous international apicultural congress, in Beijing, China. There the *Journal of Apicultural Research* took the only gold medal awarded to the world's beekeeping periodicals.

For information contact International Bee Research Assn., 18 North Road, Cardiff CF1 3DY, UK; ph. (+44) 1222-32409; FAX (+44) 122-65522; E.mail: ibra@cardiff.ac.uk; World wide web: http://www.cardiff.ac.uk/ibra/index.html.

. . . and hits THE WEB

IBRA has launched itself on to the World Wide Web (WWW), presenting over 35 'pages' of information for beekeepers and bee scientists.

For the non-webbies out there, the WWW contains literally thousands of 'pages' of information, sounds and images on a vast range of subjects – from a video recording of tropical fish to beekeeping – which are accessed via the internet. All you need is a web browser such as Netscape or Mosaic (both freely available on the internet) and the address of the web site.

IBRA's web address is: http://www.cardiff.ac.uk/ibra/index.html

Our current pages include information about our library services and a list of the journals we receive (which is most of the beekeeping journals in the world); the journals we publish (*Bee World, Journal of Apicultural Research, Apicultural Abstracts* and *B.mail*); books we publish ourselves and other books we well; meetings organized by IBRA and how you can be part of IBRA.

We also have a page with links to other sites around the world that will interest bee people, and a list of e.mail addresses of IBRA contacts.

We are still developing the site and adding new pages, so watch for innovations. Visit our web site soon.

Contact: Dr. Pamela Munn, International Bee Research Association, 18 North Road, Cardiff, CF1 3DY UK; E.mail: ibra@cardiff.ac.uk, FAX (+44) 1222 665522.

HONEY BOARD NEWS

Make a shake. Make a snack. Make muffins for mom and dad. Just start with honey and you can make magic!

The National Honey Board is sharing the magic of honey with kids in its new recipe booklet "Honey Magic – A Cookbook for Kids."

The six-page brochure includes recipes, honey snack tips, full-color photography and fun science facts about bees and honey.

"Recipes have playful titles like *Honey Parlez Vous Parfait* and *Honey Care to Take a Dip?* Elementary school-age children can prepare these easy recipes with a little supervision from an adult helper," said Mary Humann, marketing director for the National Hone Board. "We want kids to appreciate the magic of bees and the magical sweet taste of honey."

The brochure will be publicized in kids' magazines and distributed via childrens' organization.

Kids can receive a free copy of the brochure by sending a self-addressed stamped business-sized envelope to Honey Magic for Kids, c/o National Honey Board, 390 Lashley St., Longmont, CO 80501.

Additional copies of "Honey Magic – A Cookbook for Kids" are available for 25 cents each.

As the brochure says "Abracadabra, bees and thank you."

Aunt Jemima Ready-To-Bake Biscuits and the National Honey Board have developed eye-catching promotional materials to help food service operators merchandise biscuits and honey on their menus.

Biscuits and honey provide food service operators with fresh baked goodness and homemade taste. During the first months of 1996, Quaker's national sales force will be promoting this new biscuit line by preparing honey-topped biscuits for food service operators. Table tents and posters which feature honey and biscuits and the Honey Board's logo are available to food service operators at no charge.

NEW ARS ADMINISTRATOR

Agriculture Secretary Dan Glickman announced (October 16) that Floyd Horn has been named administrator of the U.S. Department of Agriculture's Agricultural Research Service. As administrator of ARS, Horn will oversee the management of USDA's agricultural research arm. This includes national and international research in improved crop and livestock production, pest management, livestock diseases, food safety and biotechnology, human nutrition and sustainable agriculture.

Groeb Farms Not Guilty

kim flottum

After only a little over an hour of deliberation, a 12-person jury in Federal Court in Ann Arbor, MI found Groeb Honey Farms not guilty of 53 counts of FDA charges of conspiracy, mail fraud, wire fraud and adulteration of honey. Two employees in FL had charges of conspiracy and perjury before a grand jury dismissed.

Charges stem from that grand jury hearing that returned the multiple indictments in January of this year.

Basically, the charges stated that between 1984 and 1992, Groeb Farms knowingly added non-honey food products to pure honey, and sold the resultant product as pure honey.

To substantiate the case, FDA Prosecutor Jay Bratt requested from Groeb Farms specific sales records from 1988-1993. These records had anything to do with the purchase and sale of honey. They also compiled the purchase and sales records of fructose and sugar water (used as a glaze for cookies).

Because of the complexity of Groeb's records, the FDA concluded that more honey was sold than purchased, and less fructose and sugar water was sold than purchased.

To further support their case, witnesses were brought in that had seen honey blend solutions being prepared; had heard of adulteration taking place; that explained how Groeb's records were examined and why the conclusions were reached; and current and previous customers. An expert witness was brought in to explain the basics of honey.

To address fructose and sugar water use, several beekeepers were called in to explain how and how much of these were used as bee feed. Groebs were maintaining bees in MI and FL at the time, but the numbers of colonies were in dispute. They were also selling both as bee feed to customers.

The Government contended that more honey was sold than bought, less fructose and sugar water was sold than bought and that, because of eyewitness accounts and reports, plus differences in fructose and sugar water used as bee feed for in house bees, honey sold was adulterated.

The defence, Robert Harrison from Bloomfield Hills and S. Allen Early from Detroit representing Groeb Farms went back to the basics.

Called to explain honey basics was Dr. Nick Low from Canada. He spoke on video. Nick Sargentson, also on video, a honey dealer and importer explained the global situation of the honey market, and honey conditions and types. He also discussed the regulating of importing adulterated honey that has been cleared by USDA, whether or not tests were made. Ken Winter, who with Dr. Jonathan White developed the SIRA Protein test for honey adulteration, determined that the samples taken by the FDA were not adulterated. Nor, after examining the results of the FDA analyses, and customer analysis was there a record of adulteration. The results, however, were not overwhelming, due to the inexactness of the SIRA protein test and the relatively small number of samples examined.

Witnesses for the prosecution however, indicated that the results showed consistent adulteration, along with data from other tests.

There was considerable discussion on invoicing and on the amount of syrup given away, used to feed bees, destroyed and used in other products. Depending on the perspective, the difference in amounts was substantial.

Honey invoices, too, were disputed, with honey produced by Groeb's bees, honey destroyed and basic accounting procedures causing adjustments to figures from both sides.

In the end, the testimony seemed to indicate only a difference in record keeping interpretation, not a diliberate attempt to defraus. And, perhaps, all the 'legal' Chinese honey, with or without syrup added before it got here, may have played a role.

The final verdict – "Not Guilty" – does not mean innocent Nor does it mean "Guilty, but a good lawyer got them off." It means, in black and white (but seldom are things black and white), that the government failed to prove, beyond reasonable doubt, guilt.

•

The variables that enter into this case, no matter your beliefs on the outcome, are resident in every operation that keeps bees and packs honey. Record keeping, employee relations, quality of product purchased, quality of product produced, honesty, profit, loss and business integrity are all important. Negligence of any can result in significant problems.

This trial cost both sides a substantial amount of money, lost time and, probably, a somewhat diminished reputation. It is unfortunate that a large honey packer has had to defend their day-to-day business practice, an operation that, after it was all over, is not unlike many packer operations. And, a Federal agency spent time and resources to no avail.

Can your business, no matter the size, afford the fees and time involved in proving yourself "Not Guilty?"

"The FDA's case simply did not hold up."

Bob Harrison

Information for this article was obtained from Ernest Groeb, Attorneys Hamilton and Early, and Troy Fore. For a detailed account of the trial, contact the American Beekeeping Federation at 912-427-8447.

1995 Reader's Index

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BOOKS, SOFTWARE, AND VIDEOS

B book
S - software
V - video

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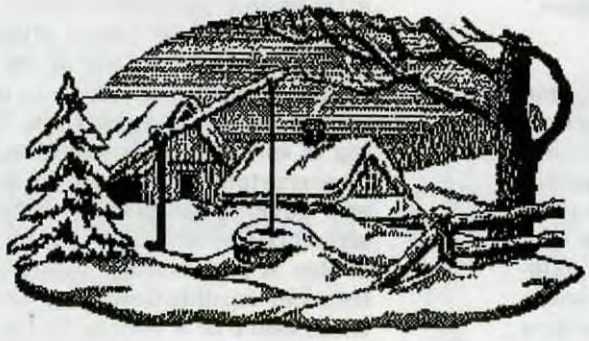
TITLE LISTING



To Our Many Friends and Customers

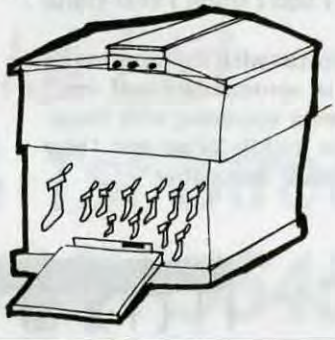
We take this opportunity to thank you for your patronage and support during the past year and all the years before. It is you, our friends and customers who have allowed us to remain in business and complete our 71st year serving beekeepers. We are deeply grateful to each and every one of you and want you to know you are appreciated.

We wish, for all of you, the most joyous of holiday seasons and a peaceful and prosperous 1996.

Sincerely,
Sarah L. Manion,
Earl King and

THE WALTER T. KELLEY COMPANY
P. O. BOX 240 • CLARKSON, KY 42726-0240

Display Index



This is a strange admission, but I sleep with my hive tool. Not in bed, but it hangs nearby on a peg, alongside my closet. All year long. It just hangs there, and often its glinting metal is the last thing I notice before turning off the lights.

I've done this for years, but just realized it when I had the following conversation with my wife:

"Why do you keep your hive tool hanging in the bedroom?"

"Why?" I sputtered, "Why, just because."

"But you don't keep any other bee equipment in our bedroom."

"Just in case."

"In case of what?"

I couldn't answer, but she was right. My bee suit, gloves, veil, helmet and smoker sit in the basement cabinet. When suiting up, I always have to remember to bring my hive tool with me, so it's not for convenience that I do it. I went to bed puzzled, and dreamed of Shinto warriors wrapping up their bamboo shanis in bedsheets and sleeping alongside their weapons. In the morning, my thought was, for manliness, I suppose. But, clearly I didn't see myself as a gung-ho soldier doing battle with bees. In fact, my 'Nam' duty was spent as a manual mimeograph machine operator cranking out orders and army songs at Fort Dix, NJ. Besides, I think of bees as my allies in creation, not my enemies.

So why have I absentmindedly hung my hive tool in plain sight? For home projects? As decoration? As a weapon I can use in the event a burglar enters my house? As a way to communicate with the bees during winter, sort of a TV antenna? A talismanic sign, almost like a cross?

Well, one thing I can say – I don't use my hive tool for anything other than bees. Although it might be useful as a scraper or wedge or screwdriver, it is not something I turn to. Besides, I wouldn't want to chip the sharp end or gouge the steel or bend the metal.

As a decoration, I asked my wife, a college art instructor. She insists there is no aesthetic value in a hive tool. Using art-speak, she offers her comments.

"Although the concave curving is pleasing, there's no rhythm to the steel. And although the prying end is nicely symmetrical, there's no action to the flow. Certainly, the rutted silver pocked with blackish bits of wax adds no color to our decor." No, she says, the hive tool does not stand up to her framed collages or even my metal sculptures (a jumble of metal welded together) as art. And I'm inclined to agree.

Is it a weapon I'm after? Subconsciously, do I feel safer with a hive tool close by? I took this up with my friend, Bill, at our weekly get together at the uptown donut shop. Bill, who owns a black belt in Shim Gum Do, examined the hive tool. He decided that it wasn't much of a weapon. He pointed out that the sharp edge was too blunt to cut flesh, that it wasn't heavy enough to knock someone out, and that since it had no handle, it wasn't throwable. Moreover, if I were to confront a midnight intruder, the person would probably burst out laughing. Bill asked me if I ever heard of an attack on someone using a chisel, which is what the hive tool resembles. And I had to answer that I hadn't. Truthfully, I don't think I ever think of the hive tool as a weapon.

So what about a telepathic communicator with my bees in the back yard? Am I trying to talk to them in some subliminal way? Not really, for I don't think of myself as ever speaking with them. Besides, what would I say to them in the middle of winter: "Hey gang, it's 24° today, but it promises to be 55° tomorrow."

That leaves a quasi-religious sign, so to speak. Why not? People practice strange customs. We avoid walking under ladders, throw salt over our shoulders, and pull apart daisy petals to tell what our spouse/significant other/girlfriend thinks about us (she loves me, she loves me not, etc.). So maybe hanging up of my hive tool is a talismanic good luck charm that says at different times different things. At the beginning of the long winter, it wishes the bees an abundant store of honey. With the bursting of spring, it says – now go, diligent providers, gather all the nectar and pollen your brave hearts and strong bodies will allow. In the crux of May, it pays homage to the hive's internal equilibrium, hoping that there won't be a swarm. In the late summer, it salutes the industrious insects, wishing for an enormous harvest. Yes, I think that's it.

My hive tool hangs on my bedroom wall as a reminder of the bigger bee world outside. It says, 'to life.'

To Life

howard scott

FROM MY BOARD