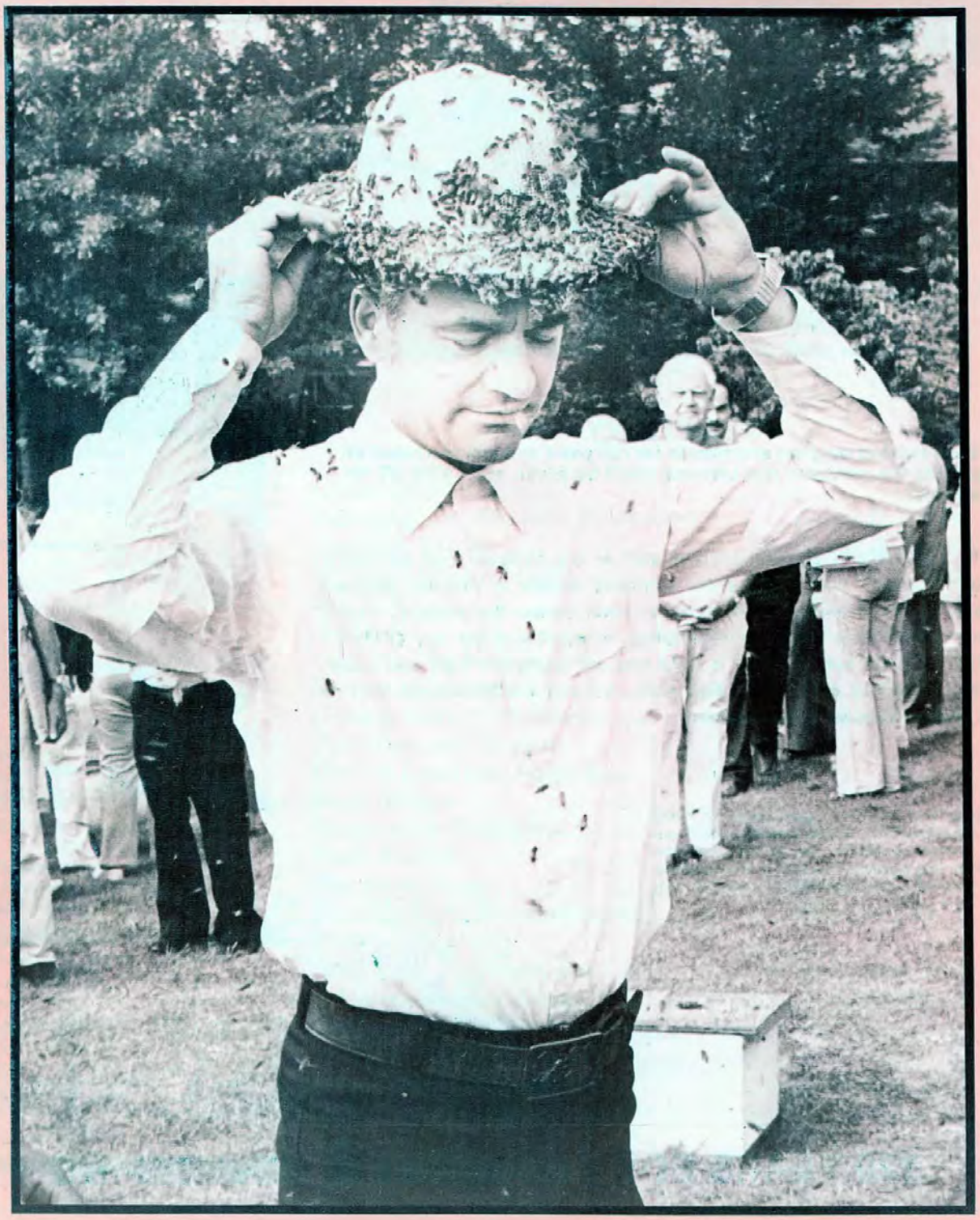
GLEANINGS IN BEE CULTURE

FEBRUARY 1983



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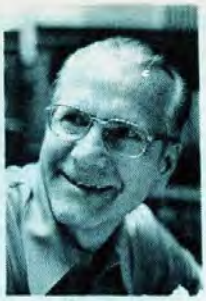

Lawrence Goltz

Lawrence Goltz, Editor
THE A.I. ROOT CO., PUBLISHERS
P.O. BOX 706
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John Root, Associate Editor
Dr. Roger A. Morse, Research Editor
Renee Harrison, Advertising Mgr.
Rebecca Hall, Sub. Mgr.

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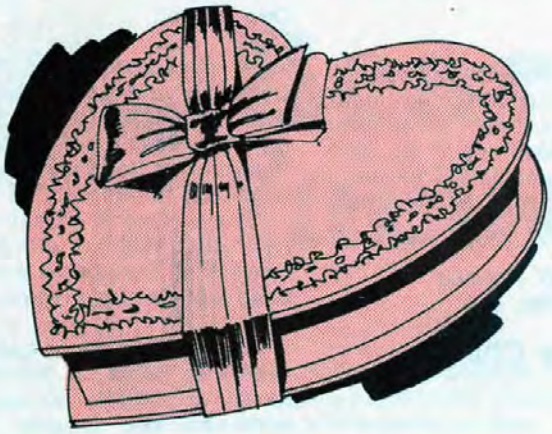
Cover Story

James Johnson of Terra Alta, West Virginia somewhat gingerly places his helmet on his head during a demonstration at the E.A.S. in Morgantown, W. Virginia.
Photo by John Root

Gleanings in Bee Culture



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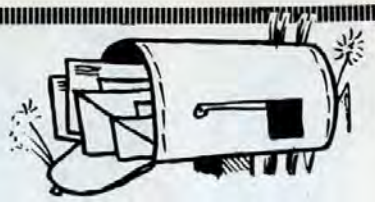

Zone Correction

Dear Editor:

The article on "Bees and Gardens" was very interesting! One statement on page 679 may need correction; *Salix discolor* is indeed one of our best early sources of nectar. The table says it occurs in zones 6 to 8. Zones 4 to 8 might be nearer right.

Francis O. Holmes
Henniker, NH

Problems Change

Dear Editor:

Having been a subscriber to *Gleanings* since about 1936, with the exception of time I served in the Air Force in World War II, I sure would not want to miss a single issue now.

I have enjoyed every issue that I have received over the years, I believe I have one stored somewhere and get a kick out of going way back and reading some of the oldies.

Some facets of beekeeping have changed considerably since that first issue I read. The basics remain the same, though. One big change is disease control. EFB and AFB are no longer of serious concern to alert operators. There are new threats to the industry on the pest or disease problem and there is hope they will be controlled.

For a number of years now, the biggest problem to the beekeeper has been the widespread use of insecticides and herbicides in agriculture. They have caused very substantial losses in our hives and bee pasture. In central Nebraska and several areas of the country, that use has put the honey producing industry on the ropes. Central Nebraska has lost a considerable number of colonies due to beekeepers quitting or moving to new areas where pesticides have not done so much damage. At present ('81 & '82) there has been a lessening in the use of these pesticides due to their increased cost and declining prices of farm products grown here.

Walter Baumgarner
Arcadia, NE

Nectar Sources

Dear Editor:

To quote from Mr. DeYoung of DeYoung and Sons, Box 14, Rt. 2, (Perkins) Hull, Iowa 51239. "the Siberian Pea Tree", (also known as the Siberian Bee Tree in some circles) is known botanically as *Caragana arborescens.* This is an extremely hardy tree which fills out with bright yellow flowers in the spring and which the bees just go crazy over—."

Without the use of Latin names to describe items of horticultural interest, it is almost impossible to tell whether Mr. Duane Bisher of Russiaville, Ind. is asking about the same tree or not. Fur further information, and quotes on prices and quantities, I suggest he write Mr. DeYoung.

The only other two trees that I can think he might be referring to are the tulip poplar, redbud, or possibly black locust (not the same as honey locust).

But if Mr. Bisher is seriously interested in creating bee forage, I would suggest the best bee forage we have found over the years (and we have tried many things from sainfoin to cleome); plant a spring stand of brocoli and let it go to seed. In the fall it is covered with bees!

Jeanne Roberts
St. Paul, MN

Note: Mr. Bisher was referring to *Evodia daniellii,* the tree commonly known as the bee bee tree.

The Editor

Tree Seeds

Dear Editor:

I do have a large supply of Bee-Bee tree seeds and would be pleased to send anyone some seeds. If they send a self-addressed, stamped envelope, plus .25 in coin or equal amount of stamps, I'll send the seeds as long as they last. I am not in the seed business, and have no catalogue. I am 82 years old, retired, and still active with bees.

James Fodor
77 Carlton Ave.
Trenton, N.J. 08618
PH: 609-882-0858

"Enjoys Old Timer"

Dear Editor:

Just taking time to send off a short note to let you know how much I look forward to receiving your magazine each month. As a hobbyist, I "glean" many helpful ideas and techniques, and especially enjoy Richard Taylor's articles.

But the purpose of this is to encourage more articles by "The Old Timer". I thoroughly enjoyed reading his moving story of the old recluse, John. His style is a refreshing change from the equally interesting but more informative columns. Let's see more!

Tom Theobald
Ferwandina Beach, FL

On Imports

Dear Editor:

I understand there is growing pressure in Washington from the agricultural community concerning the inequities in import export regulations between the U.S. and other countries. These regulations and trade policies coupled with increased U.S. dollar values have made trade nearly impossible. It seems foolish to me that our government should continue an open door policy with countries that will not allow us the same privilege with them.

Continuing to allow unrestricted honey imports into this country while the American taxpayer must buy and distribute our higher priced honey for free seems very unfair. I do not believe that we in the industry have the right, since so few of us profit from it, to ask the taxpayer to do this. If we were producing a surplus, and we aren't, I could understand present government policies. I do not belive that the U.S. taxpayer should have to subsidize unrestricted surplus imports and I feel the vast majorit, of the honey producers agree. Present retail prices reflect current government subsidy prices and not cheaper imported prices anyway so it seems to me that it is time that we in the industry begin to correct these problems. If we allow them to continue as they are, all Americans will be eating imported honey one day. If they can afford it!

Don Shenefield
LaFontaine, IN

Orcutt print courtesy of Washington State Game Department
(From Poelker and Hartwell, Black Bear of Washington, 1973)

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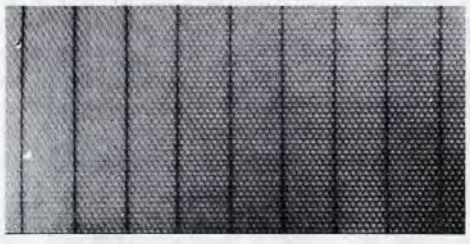

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Searching For The Best Equipment

By GRANT D. MORSE
Saugerties, NY

Beekeepers have been searching for thousands of years for the best type of hive. The furniture of the hive has been an even more difficult problem. Choosing the right kind of foundation still plagues some operators. Hive sizes have always been a challenge.

Every beekeeper must choose what size hivebody he shall use — or else he accepts what is forced upon him. Does it make a difference? Is there any one size hivebody that is decidedly preferable from the point of view of producing a larger crop, or wintering better? Is there any one size hivebody that makes working with the bees and equipment easier and more comfortable?

Size of Hive Bodies & Supers

Probably we should dispose of the question of size as it affects ease of operation, first. All of us know that any size hivebody larger than the Langstroth dimensions makes lifting a burden. But isn't the ten-frame (or even nine frame) Langstroth deep size a bit too heavy to lift off and back on to the stack when manipulating a colony? As an older beekeeper I find it so. But most beekeeping is done by young and vigorous men, and occasionally a few women. Many say they don't mind it, especially when the super is full of honey to be extracted.

Certainly, a super of eight-frame size, or half depth, or one 6 and 5/8ths in depth is easier to handle, to lift, to set to one side. Probably the only perfect answer to the question of size as regards ease of manipulation is that any size smaller than the Langstroth dimensions, is easier. And each beekeeper has to answer the question whether the virtues of the Langstroth dimensions are great enough to overbalance the difficulty of lifting that the use of it entails.

How about the size of the hivebody when it comes to accomodating the quantity of honey the bees need for winter? Two hivebodies of Langstroth dimensions seem quite satisfactory to most beekeepers. Certainly the two frames that a ten-frame hivebody provides, in excess of the number in an eight-frame super, have often proven of insurance value during a long winter, or even a more demanding spring. There isn't much doubt that one and one half hivebodies provide all the room for stores and brood that most colonies need until the time in spring when a third body can be added. But a hivebody of half depth does not allow for exchange of frames, and that, in the minds of many beekeepers, is too important to permit the use of half-depth supers. That is my personal conviction, too, after having used them for a considerable length of time. I was glad to see them go.

How about a hivebody 6 and 5/8ths in size? Of course they're more expensive to use since the frames for that size hivebody cost nearly as much as those in a hive of Langstroth deep dimensions. It takes about as long to handle them, too.

But there are doubtless some advantages. They're lighter, to begin with. A super of 6 and 5/8ths dimensions when full of honey weighs a little bit less than 7/10ths of what a regular hive of Lanstroth dimensions weighs. That's quite a relief, even to a stalwart man who has to lift them all day long.

Three such supers will accomodate almost exactly the same amount of brood, and the same quantity of honey, as two Langstroth supers. Also, three such supers provide more space for a wintering cluster than the Langstroth dimensions. That's because two intervals or spaces between the tops and bottoms of the frames are available versus one such space between the frames of two Langstroth supers.

I know of no perfect answer to the question I have raised — and which many a beekeeper has raised during his lifetime. I'd say that if you don't mind lifting a heavy load every time you make a manipulation of a colony during the year, and if you don't mind lifting 60 to 70 pounds every time you take off a super of honey, then the Langstroth deep dimensions are quite satisfactory. Personally, I favor the 6 and 5/8ths dimensions.

Man has been struggling for thousands of years to find a container, or hive, that fits his needs and also is adjusted to the bees' convenience. The first hivebody was probably a section of log with a cavity, a hollow space, in which a swarm had elected to locate. At first, man probably contented himself with stealing all or part of the honey hoard he found in such cavities.

History of Hives

Paintings in caves once occupied by man depict him robbing such cavities in trees and in rocks. Such a painting was discovered in eastern Spain dating back possibly to a period as early as 7,000 B.C. or earlier. Since the female of the human species was commonly the gatherer at the time when the male was typically the hunter, the individual shown in this rock painting, or drawing, was likely a woman. That she suffered many stings as penalty for her theft is suggested by the presence, shown in the drawing, of many bees flying about her largely naked body.

Eventually it probably occurred that some prehistoric man found a colony of bees in a container of some kind, perhaps a length of transportable log, or an earthen vessel, into which a swarm had ventured. This find encouraged him, doubtless, to begin tending bees in similar receptacles.

Over the centuries and millenia, he experimented with containers that best suited his needs. They varied from earthen pots, to hives made of straw, of bark, or cork, or wicker work, lengths of hollow logs, and so on. My uncles in the early 1900's used wood packing boxes secured from the grocery store. They learned that the bees would not tolerate such boxes as home quarters if they retained unpleasant odors from their former contents such as hand soap, or similar offensive origins.

Next, these early human beekeepers struggled to adapt the containers in such a way as to enable them to remove a part of the honey hoard without killing the bees, and hopefully without getting stung unacceptably. One of their customs was to cut away at the bottom of the container a portion of the honey.

Some early tenders of bees used a second section at the bottom of the nest. It was attached in such a way that it could be removed without destroying the members of the bee colony. More recently, beekeepers tried using containers at the side of the brood nest. These didn't work so satisfactorily as receptacles at the top of the nest. Sulfur was used in recent years, prior to 1851, and even subsequently, to kill the bees in the fall and enable the operator to harvest the entire crop of honey. But this method destroyed the colony's further usefulness, of course.

Until recently many beekeepers favored the use of relatively small colony quarters in order to encourage extensive swarming, the only then-known device for replacing the bees that had been killed in order to secure the whole honey crop.

Langstroth was not the first individual to experiment with movable frames. There was also a desire to construct a hive in such a way as to enable the human observer to spy on the behavior and operations of the bees without removing any part of the container. Glass exteriors were used for this purpose but they did not reveal too much. Huber, the blind French/scientist who observed bee behavior through the eyes of an assistant, used a leaf frame arrangement — a device which may possibly have been in limited use by scientists previously.

R.A. Reaumur, a French scientist, reports that the Italian astronomer Maraldi, found single-comb observation hives in the garden of the French Royal Observatory in Paris in 1687. This is approximatley a hundred years earlier than the reported use by Huber of his leaf hive.

Until Langstroth's discovery in 1851 no one apparently succeeded in the commercial use of a hive with movable frames that the bees did not at least partially attach to the tops and sides of the hive with propolis and wax.

However, Sir George Wheler in England reported in the year 1682 that the Greeks had manufactured a wicker hive with frames that were removable. This feature enabled them to split their colonies in the spring and build nucs. How close they were to the secret of bee space discovered by Langstroth in 1851.

L.L. Langstroth was a minister of the gospel, a resident of the Philadelphia area at the time of his discovery of bee space. Beekeeping was his avocation, or scientific interest. He is said to have owned a leaf hive much like Huber's that employed the use of bar frames. They were not constructed in such a way as to prevent the bees from partially fastening them to parts of the hivebody. This hive, perhaps through accident, rather than thorough conscious planning, provided for the use of a super with a space between it and the main hivebody of approximately 3/8ths of an inch.

Langstroth noted the effect of this space, and it is possible that it created the germ of an idea that finally caused him to try out a similar space between all the frames, and the other parts of the hive. When a trial proved his hunch was right, he records in his writings having shouted Eureka! And well he might have done so, for none of his predecessors over a period of thousands of years had perceived the fundamental significance of bee space.

Langstroth patented a hive that incorporated the details of his finding but he made no financial profit from it. This was chiefly because it was so easy for other beekeepers to copy the newly found features of bee space without paying for the privilege. Langstroth's discovery of the significance of bee space led promptly to the invention of the extractor, the wide selling of liquid honey, and the repeated use of the hive frames after their combs had been extracted.

What of the Future?

Today, the experimentation with variations in the use of material for frame making, foundation, and the design of the frame continues. There are few dimensions of a so-called ideal hive that have not been tried — or are not being currently tried. As I said earlier in this article, the ideal hive depth and dimensions may not yet have been realized.

I recall visiting one commercial beekeeper, now deceased, who firmly believed that a nine-frame hivebody was preferable to one that accomodated eight or ten frames. He may have been right. He believed he had found it so.

Experimentation is the normal path to improvement in any field. Beekeepers should experiment. But the fact that off-size equipment does not bring a price comparable to that of commonly accepted standard size makes it inadvisable for most individuals to indulge in variation on a large scale.

Have we found all the changes that are needed to make beekeeping easier and more profitable? No. We have only just begun. I predict that the future hive, its hivebody, bottom board, cover and so on will be made of compressed material similar to cardboard.

The frame of the future (the near future, not the distant future), may be a one-piece affair made of compressed high grade plastic. Its top bar will have a slot in the center through which the sheet of foundation may be dropped down to the bottom bar which will be of solid construction. Four strips of material almost as fine as a wire will run horizontally to act in place of the wires that now have to be installed at considerable expense of time and effort. The time required to install a sheet of foundation will be thirty seconds or less. No nails, wires, or wax will be necessary to secure the foundation.

Wax will probably continue to be the substance of which foundation will be made. Plastic or metal has too many faults. Bees like beeswax.

The hivebody of the future will probably be something like 6 and 5/8ths in depth. It's easier to lift.

Machines may perform many manipulations, chiefly making lifting easier.

Beekeeping outfits will get larger — like farms. But the courageous small-scale operator will not be put out of business provided he's inventive. There's too much fun in beekeeping to permit the demise of the small time operator.

The honeybee will be progressively bred on a selective basis, inclined to sting only enough to enable it to protect its nest, but not be a nuisance by way of its stings to the operator.

Standard vents in the hive equipment will be built in to be used to provide exits for the moisture during the winter.

Cut comb honey will gain in popularity. It will be marketed in plastic boxes, as now.

An approved gas or insecticide will be developed to destroy the few bees lingering in the extracting supers after the blower had done its work. A satisfactory gas for the killing of wax moths in stored honeycomb is needed, and will be provided.

Beekeeper cooperatives will grow in number and in strength, and serve as processors and sales agencies, leaving the beekeeper free to specialize as a producer of honey and wax.

Beekeeper literature will become more scientific, that is, more informative, more detailed, and more reliable.

Fewer drones will be produced in hives. The experts today claim that the drones do not reduce honey production. But they certainly do reduce the production of workers, and they unnecessarily consume the time and attention of nurses.

The few experienced beekeepers who are occasionally induced to use gloves in the bee yard may find that a short glove that provides protection for the three fingers that grip the frame may be all they need. That glove would give only finger length protection.

Smoker fuel in bales will be offered by bee supply houses. An alternative form of fuel will be in cylinder form made so that it fits loosely in the chamber of the smoker. It will have been impregnated with a chemical that ignites and burns slowly, similar in nature to the ready-burning fuel that is now used in outdoor grills.

If you're inventive by nature, there's plenty of oppoortunity left for you to devise improvements in bee materials,and help find "The Best Equipment."□

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Research Review

By DR. ROGER A. MORSE
Research Editor of Gleanings
Professor of Apiculture
Cornell University
Ithaca, NY 14853

Learning About the Sugars in Honey

ONCE UPON A time we thought that sugars were fixed things that never changed. The introduction and commercial production of fructose and high fructose syrups, which has been undertaken only in the last decade or so, has caused sugar chemists to re-examine the common sugars. As a result we are learning more about them and at the same time we are gaining a better understanding of honey and its special virtues.

Three sugars are found in honey: sucrose, glucose and fructose. Sucrose is the best known of these; common, white table sugar is pure sucrose. Sucrose is the most common sugar in nectar but bees add an enzyme to nectar that converts it into glucose and fructose. Honey contains only about one percent sucrose. Glucose is the common sugar made from corn. It is the sugar used in most candy bars because it is the least sweet of the three and one can therefore eat much more candy at one time if it is made with glucose.

The author of the paper below visited Finland recently. Since that country produces almost no sugar, chemists there are especially interested in learning more about all sugars. Fructose is the sweetest of the common sugars and countries that import sugar need to import less if they import one that is sweeter. According to Finnish test, if sucrose is given a relative sweetness value of 100 then glucose has a value of 58 to 87. Glucose, it has been found, tastes sweeter at higher concentrations. Fructose has a value of between 87 and 114; interestingly, fructose tastes sweeter at lower concentrations. (In some other papers I've seen fructose given an even higher value.)

Finnish researchers have some interesting figures on the solubility of the three sugars in water. A solution of glucose is saturated when only 51 percent sugar is present; that means that when more than this amount of sugar is present it will tend to granulate. A sucrose solution is saturated at 67 percent and a fructose solution only when 81 percent is present.

It has been known for some time, of course, that a honey high in fructose, such as tupelo or sage, is much less likely to granulate than a honey that is high in glucose such as rape or dandelion. I found it interesting to learn that a solution containing more that 60 percent fructose can keep a greater quanity of glucose in solution.

It is well known too that honey will pick up moisture anytime the humidity is more than about 60 percent. In fact, this is often a problem with honey as it may cause fermentation at its surface. It now appears that this characteristic of picking up moisture, called hygroscopicity, is due almost entirely to the fructose that is present. One of the chief reasons honey is wanted in baked goods is that it retains this characterisitic in the finished product; honey helps to keep breads and cakes in which it is used moist and thus they have a longer shelf life.

Still another important quality of fructose is its browning quality in breads and cakes. Certain chemicals are formed when any acid solution of a sugar is heated; however, when fructose is present the reaction is more intense. Cooks are aware they must remove products baked with honey from an oven sooner than those made with sucrose or glucose. Otherwise, they may show a burned appearance.

Crane, E., Learning about honey through fructose. *Bee World* 63: 174-7, 1982.

Honeybee Virus Diseases

Eighteen virus diseases of honeybees have been identified over the past several years by Dr. L. Bailey of the Rothamsted Experiment Station in England. We know very little about virus disease in bees and Bailey is really the only authority who has spent any time studying them. It is difficult to study viruses; the information available indicates that they may be present in a colony for a long time before any disease symptoms are noticeable.

Bailey feels that keeping too many colonies in an area that cannot support them may be one of the factors causing a virus disease to show itself. When there is insufficient natural forage the diet of the bees may be affected adversely. Prolonged feeding of sugar to colonies may likewise cause trouble, says Bailey, presumably because the bees lack the balance of nutrients normally present in honey. In some parts of the world, of course, it is routine to harvest all of the honey, because of its high price, and to substitute sugar syrup as winter feed.

One of the problems of moving bees from one part of the country to another or from one continent to another, Bailey points out, is that they may carry their diseases, including their virus diseases, with them. This is a precaution with which we are increasingly concerned because of the way we have seen various bee diseases spread in recent years.□

Bailey, L., Viruses of honeybees. *Bee World* 63: 165-173, 1982.

Monthly HONEY Report

LAWRENCE GOLTZ

December 10, 1982

The following figures represent the current prices reported by beekeepers and packers over the country. They are based on reports from many states averaged out for each region. Where insufficient information is received no price is shown. The retail prices represent the price of each size jar.

Wholesale Extracted — **Reporting Regions**

Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	9
60 lbs. (per can) White	42.00	43.00	34.80		36.00	38.50	33.00	36.50	34.00
60 lbs. (per can) Amber	42.00	38.00	31.20		35.00	37.50	30.00	35.50	33.50
55 gal. drum (per lb.) White	.62		.58	.57	.60		.54	.58	
55 gal. drum (per lb.) Amber			.52		.55		.50	.56	
Case lots — Wholesale									
1 lb. jar (case of 24)	30.00		25.80	25.90	28.50	24.50	24.10	26.80	24.10
2 lb. jar (case of 12)	30.50		24.20	23.75	29.00	23.50	23.50	24.50	23.50
5 lb. jar (case of 6)	33.00		26.25		29.90	26.00	25.05	27.80	26.20
Retail Honey Prices									
½ lb.	.90		.90	.83	.90	.85	.82	.92	.90
12 oz. Squeeze Bottle	1.50	1.39	1.50	1.25	1.40	1.35	1.29	1.40	1.20
1 lb.	1.60	1.59	1.50	1.40	1.55	1.55	1.49	1.49	1.55
2 lb.	2.70	2.59	2.85	2.60	2.75	2.60	2.70	2.59	2.90
2½ lb.	3.55				3.30	3.25	3.50		
3 lb.	4.00	4.25			4.10	3.85	3.75	3.95	4.10
4 lb.	5.00			5.00	4.89	4.90	4.50	4.95	
5 lb.	6.00		5.95		5.90	5.80	5.40	5.95	5.89
1 lb. Creamed			1.55		1.57			1.59	1.70
1 lb. Comb	2.25		2.25		2.00	1.85	1.85		
Round Plastic Comb	1.75		1.85		1.89		1.70		
Beeswax (Light)	2.00		1.35	1.20	1.75	1.40	1.30	1.70	1.90
Beeswax (Dark)	1.75		1.25		1.60	1.30	1.25	1.65	1.80
Pollination Fee (Ave. Per Colony)	30.00		27.50		18.00	20.00	19.00		

Misc. Comments

Region 1

Unusually warm and little snowfall. Wholesale and retail honey sales down. About 80% of the 1982 honey remains to be sold. Bees in very good condition, stores are good. A few beekeepers are selling bees to pay their bills, a very bad sign.

Region 2

Prices about the same in New York State. Bees had good flights in December. Honey sales slow in West Virginia. Prices holding steady to slightly lower. Bees in good condition with plenty of stores from good fall honeyflow. Prospects looking up for 1983.

Region 3

Sales up slightly and looking better for 1983. Bees wintering well in Indiana with ample stores. Rains hampering winter yard work but if

weather continues warm, little work will be needed. Mild winter with warm temperatures in Illinois. Bees have had good cleansing flights. Feeding may be necessary due to honey consumption by bees during warm weather.

Region 4

December was unusually mild and wet in Minnesota. Bees seem to be wintering well to this date. Honey sales fair. Supplies of honey have dried up due to price competition from Commodity Credit Corporation Loan program. Beeswax market depressed.

Region 5

Florida has had a mimimum of cool nights and frost. Citrus are making some growth in early January and bees are gathering pollen. Florida is dry in most central and southern areas. Honey selling well in North Carolina. Sourwood honey sold at about $3.00 per pound as gift wrapped item. Bees have been flying nearly every day through December, and honey stores are being consumed.

Region 6

Very mild temperatures and heavy rainfall have dominated Kentucky weather during December. Bees are in good cndition. Honey is selling well at retail level. Beekeepers not planning expansion in 1983. Very warm December in Tennessee and colonies have consumed a lot of stores. Early feeding will be necessary. Honey selling well. Above average temperatures will require feeding early in year in

(Continued on page 79)

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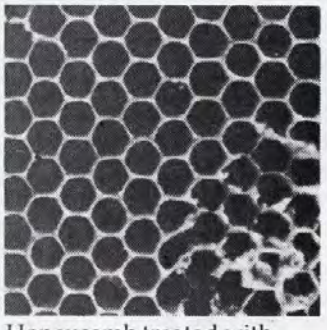
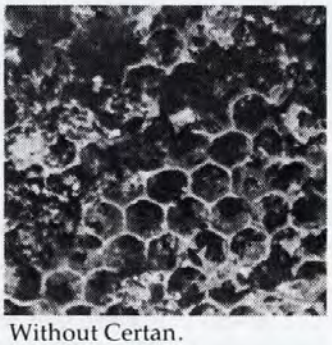


Honeycomb treated with Certan.



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Bee Talk

by DR. RICHARD TAYLOR

Trumansburg, NY

In my last couple of bee talks I've been trying to make a very basic point about the quality of honey. I'm going to express it slightly differently this time by saying that the aim and purpose of the backlot or sideline beekeeper should be quite different from that of the large commercial beekeeper. Somone who makes his livelihood producing honey has got to aim at the largest crop with the most efficient use of time and equipment. The crop gets extracted, several tons at a time, and goes into drums and off to the processing plant, never to be seen by the beekeeper again. The product is good, but it is not the very best, because shortcuts have to be taken at the expense of quality.

The backlotter, on the other hand, can give first priority to quality. Nothing in the world is anywhere near as good as top quality honey, and the small, backlot beekeeper is in a unique position to produce it. So far as quality is concerned, he has no real competition from the big honey producers. They've got to extract the honey from whatever combs they have put on the hives, warm it, usually in the presence of cappings, and even of brood and dead bees, and the final processor has got to heat it and filter it. What one ends up with after all this, is a far cry from what the bees stored in the combs.

The backlot beekeeper, on the other hand, with perhaps fewer than fifty hives, can preserve that original exquisite quality of honey right up to the point at which the consumer gets it. And have you noticed that there is always a market for something that is of really superior quality? There are peope who will pay dearly for this, and come back over and over for more. First quality ice cream, for example, sells briskly even at twice the price of other, perfectly good ice cream; people buy it without even looking at the price, just because it is so good. This seems to be true of just about everything. Even in periods of economic recession, the sellers of luxury products, from food to automobiles, seem to do just fine.

Of course the most obvious way to produce quality honey, or honey that is exactly what the bees stored in the combs, is to raise only comb honey — but I have said that so many times that anyone who reads these pages must be tired of it.

Otherwise, the road to this goal of quality is (A) to extract only from virgin combs, that is, combs that have never had any brood in them at all; (B) never to warm honey at all in the presence of cappings; and (C) not to heat the honey at all as a means of retarding granulation. It is better, if you are aiming at quality, to let the honey granulate and retain its beautiful and delicate flavor, than to have it clear and gleaming, filled with eye-appeal, but at the expense of that delicate flavor. Remember, you are not aiming at the general consumer, but at the one who wants the special quality, and is glad to pay whatever it takes to get it.

With respect to virgin combs, it has been found that honey extracted from combs that have been used for only **one cycle** of brood rearing, and which are therefore still very light to appearance, is darkened and degraded just as much as honey spun from combs that are old and black. That came as a surprise to me, but it is confirmed by experiments done in 1974 by Maryan Alber, and reported in the *American Bee Journal* of October that year. It isn't merely that honey is slightly darkened by being extracted from dark combs, or even from light combs that have been used once for brood rearing. It is very much darkened. Similar conclusions have been drawn by Professor Gordon Townsend, in Canada, based on his own experiments.

With respect to warming honey in the presence of cappings, with the view to getting it to strain more easily, the alternative to this is very obvious: Strain the cappings out **before** you warm the honey for final straining. Then, if you think you've got to warm the honey to get it strained and bottled, use a flash warmer, and try to keep it down to 100°F., which is about the temperature of a hot summer day. It has been found that even low temperatures like this, if prolonged, degrade honey. The beauty of a flash warmer is that honey can be warmed up very quickly, then allowed to start cooling down almost at once. That is essential.

Putting all this another way, we can say that the most beautiful and expensive stainless steel extracting equipment in the world isn't going to do much for you, so far as quality is concerned, if the set-up calls for honey to be warmed even slightly, in a sump in the presence of cappings, and then strained from there. It will **look** all right, to be sure. But what you want is something that really is better, and not merely something that looks good.

Actually, if the cappings have been removed from the honey before it is warmed at all, either by use of rough strainers or baffles, and the honey is then run through a flash warmer, then almost no additional straining is needed at all. Two clean nylon stockings, one inside the other, are better than any strainer ever put on the market, and they cost almost nothing. Honey, freed from cappings and then slightly warmed in a flash warmer, then finally put through this simple stocking/strainer will be about as close to perfection as any you will ever find. It is all ready for bottling and, assuming the other steps described here have been observed, and that it was gathered from an acceptable floral source, it will command a premium price.

There is no reason why backlot beekeepers should try to compete with big commercial beekeepers, when they can set standards, and prices, which the latter cannot hope to attain.

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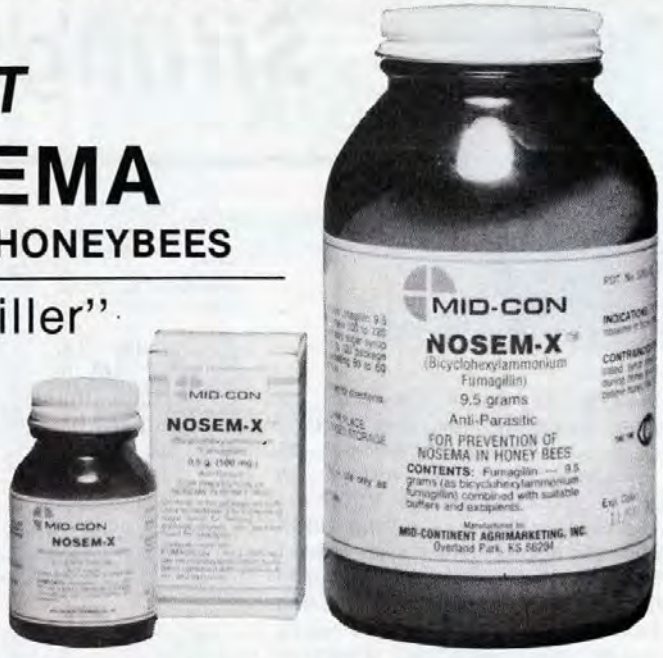

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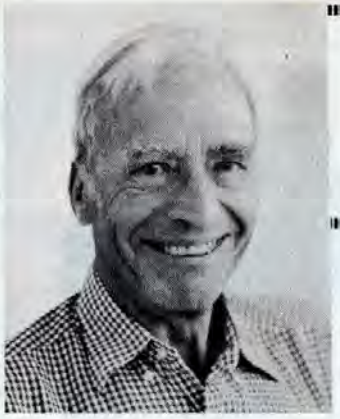


Siftings

By CHARLES MRAZ
Box 127
Middlebury, VT 05753

Recently in Barre, Vermont, a meeting was held by people that knew Dr. Jarvis to tell how much he has influenced their lives, not only in health, but in music as well. When his book, *Folk Medicine* was published in 1958, just about every beekeeper knew about him because of the great interest his book generated in the use of honey. The book was also translated into Japanese where it also generated greatly increased use of honey that continues to this day. Japan, along with Germany is one of the largest honey importing nations.

For 2½ years his book was on the best seller list for non-fiction and it is still in print and available. It sold over 3 million copies and still selling today. It is time we beekeepers revived an interest in this book again, his remedy, honey and vinegar is still as effective for good health as it ever was. No doubt the economy has something to do with the reduced honey consumption, but if the use of honey means better health, the use of honey should increase, not decrease. I believe from personal experience that the use of honey in the diet instead of sugar can reduce the incidence of heart disease, as recent tests on rats by the USDA have indicated. With heart disease causing about 50% of the deaths today, even those in middle age, the use of honey to reduce this serious disease is worth considering.

If we are to counter statements by those with no experience that say honey is no different than sucrose in the diet, we need experimental research to prove there is a difference as has been proved by the USDA research. Feeding experiments on infant animals such as rats should reveal information on the difference between natural milk and honey, and artificial formulas, for example. If such research will ever be carried out is the question. If it ever is, the beekeepers will have to do it. No one else will.

I believe that beekeepers themselves are also to blame for the drop in the honey consumption, by producing poor quality honey with high moisture content. I pack and buy quite a lot of honey every year and one of the great problems is to find good quality honey. So much of the honey being sold is "green", unripe honey with a high moisture content, that in time develops honey that will "burn" the throat when eaten, rather than the smooth, mellow flavor of well ripened honey. Good honey should have less than 17% moisture, preferably under 16.5%.

Much of the honey packed today is heated to a high temperature to kill the yeast to prevent fermentation in high moisture honey, and then filtered through plate filters that makes a very clear, sparkling honey that will not crystalize. Unfortunately honey so processed, can hardly be called honey anymore, but rather only a sweet syrup. The flavor and character of the honey is greatly reduced as well as most of the biotic enzymes.

Much of the honey we now pack is in the natural, crystalized form without heating or filtering above 110°F, so that it does not liquify. This retains much of the fragrance, character and biotic material of the honey just as it is collected by the bees. We constantly hear remarks from people that try this natural crystalized honey that it is the best honey they ever tasted. Many say they did not like honey until they tried the natural crystalized. Now they love honey and will not buy anything else. People do know the difference. The only way to increase consumption of honey is to pack honey that contains the fragrance and aroma of the flowers that produced it, honey that most people will love to eat, that will not "burn" their throats. If we can increase consumption of honey just one pound per person, per year, there will be a shortage of honey is the U.S. instead of a surplus, as we now have.

Invitations are now being sent out for the 29th Apimondia International Congress to be held in Hungary, August 25-31, 1983. There is no better way to visit another country than to attend a beekeeping congress. As a beekeeper, you are a member of the international family of beekeepers, rather than a "foreigner". You can then visit beekeepers on a personal basis where they live and work rather than looking through a cage.

So far, I have visited beekeepers in Russia, Romania, Mexico, Colombia, Germany, England, Czechoslovakia, Sweden, Hawaii. I hope it will be possible to add Hungary to the list as they are good beekeepers with a long history. If you ever have a chance to visit these countries, a new one every two years, you should by all means do so, and visit other parts of this world we live in.

By the time most beekeepers read this, the bees will be well into winter if you live in the North. The article on page 610 *Gleanings,* November 1982 by V. Shaparew on ventilating inner covers demonstrates again the importance of upper ventilation for wintering bees. Some beekeepers think the colder the climate the less ventilation they need to "conserve" heat. Actually the opposite is true, the colder the climate, the more ventilation is needed. The colder the climate, the more condensation there is of the moisture bees give off eating honey to keep warm. Cold does not kill bees, but moisture in the winter is deadly. L. L. Langstroth over 100 years ago strongly advocated plenty of ventilation for wintering bees. Yet it still has to be repeated every year to help prevent winter losses by those that do no have the experience.

Along with plenty of upper ventilation, Page 629, Staney Loyer of Maine advocates three or four hivebodies with honey for wintering. Three hivebodies is usually enough if they contain over 60 lbs. of honey. One hivebody for wintering is useless in New England. Two hivebodies if full of honey works well, but they lack room for early expansion for brood before the beekeeper can get around to put on more room in spring. Three hivebodies or its equivalent is the minimum for wintering strong colonies in the northern states and Canada.

Page 626 is an article on trapping pollen by beginners that should be

(Continued on page 79)

Capping The News

THE EDITORS

"Beekeeping Small Talk"

Master Beekeeping Programs

IT HAS BEEN interesting to follow the evolution of the Master Beekeeping programs from their early beginning to the latest developments.

The North Carolina Beekeepers Association and the North Carolina Agricultural Extension Service, represented by Dr. John Ambrose, Extension Apiculturist, are offering a new and comprehensive program for North Carolina beekeepers called the "North Carolina Beekeeper Program". The eventual goal is to involve all N.C. county beekeeping organizations in the new program.

The North Carolina program is different from the one currently being conducted by the Eastern Apicultural Society. The N.C. program is structured into four different levels which measure the beekeeping skills and knowledge of the program participants. The four levels, beginning with the program entry level, are: (1.) Certified beekeeper, (2.) Journeyman beekeeper, (3.) Master beekeeper, and (4.) Master Craftsman beekeeper. At the present time the program is being developed on a no-cost to the beekeeper basis and is open to any resident of North Carolina.

Two primary reasons are given for the initiation of the program: (1.) To fill requests from beekeepers for a system to improve beekeeping knowledge and skills on a continuing basis, and (2.) To provide a system to measure their levels of experience in an objective fashion.

An important part of the requirements for fulfilling each achievement level are the public service units. This unique requirement, combined with the practical tests and mandatory years of beekeeping experience makes the North Carolina more inclusive than the well known E.A.S. Master Beekeeper program which has been criticized as being too rigidly structured or too difficult. The fact that comparativley few have passed the E.A.S. program may indicate some shortcomings; if not in the program itself, in the preparatory phases.

The general requirements for advancing through the levels of the N.C. program consists of passing a written examination and a practical test, which are offered at meetings of the North Carolina Beekeepers Association, by appointment at the Apicultural Office at the State University, by a State Apiary Inspector, or, at other arranged stations. As mentioned before the requirement unique to the N.C. program is the public service requirements for all except the entry level. Credits are given for such beekeeping related activities as teaching bee courses and service to bee associations or related activities.

According to comments in the Western Apicultural Society Newsletter the W.A.S. is opening discussions regarding a similar program for that organizaion.

Set Aside Acreages

There are proposals in the works to pay farmers in stored grain for reduced acreages planted. While the plan is aimed at grain farmers, other agriculturists, including beekeepers, may benefit. Hopefully, some of the set aside acreages will be planted to legumes or other nectar bearing soil improvement crops. Suggestions along this line may be submitted to the Department of Agriculture, Office of Secretary, Washington, D.C. 20250. Most effectve are letters which originate from beekeeping organizations representing a number of individuals.

The purpose of the Payment In Kind (PIK) program is to reduce grain surpluses in storage with Commodity Credit Corporation and bring production and demand into balance. In return for a promise of possible help to the beekeeper, the Office of the Secretary asks for help in presenting this program to farmers, making sure that they understand it and that they appreciate the effort that went into creating this program.

Wintering Bees

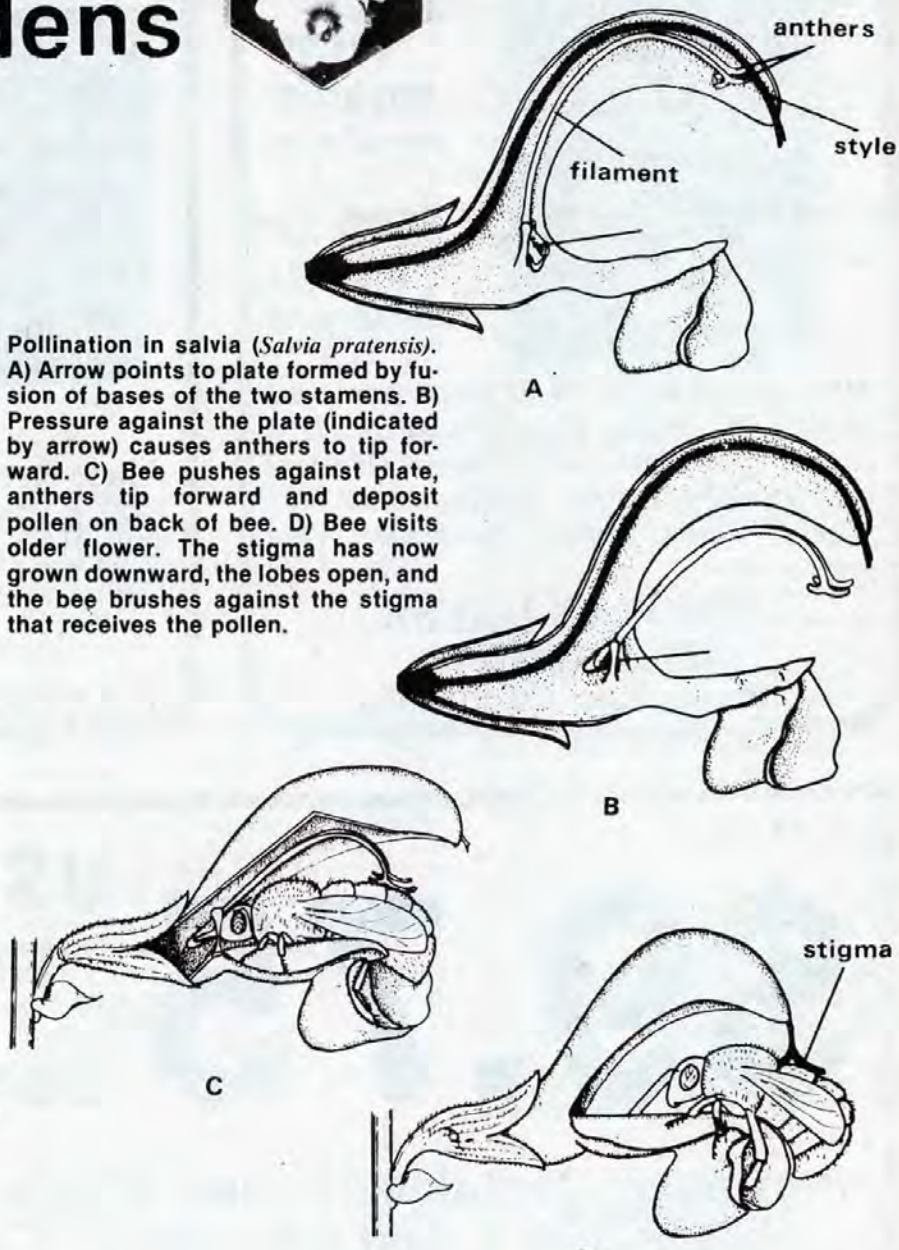
Experienced beekeepers are aware that there are at least two periods of the year which have a decided impact on overwintering bees. The first period is the fall months when the bees which form the winter cluster are being raised and winter stores are being placed properly in adequate quantity. The next critical period is the late winter and early spring months when brood rearing begins, food supplies may become depleted and changing weather conditions create stress.

As this issue reaches readers in the South and Southwest the latter period will be nearing. Most bee colinies, given the opportunity to store and retain enough honey or fed sufficiently this past fall, will fare well if colony strength and vigor was sufficient to carry them through the winter months. A prolonged brood rearing period in the spring can quickly exhaust even a seemingly ample food supply. In some areas, warmer than normal weather has increased bee activity, causing more than average use of winter food supplies, as compared to a moderately cold winter which keeps bees fairly closely clustered and activity at a minimum.

The purpose bringing this to your attention is to warn of impending food shortages during the coming months, although most reports as of this date indicate that colonies are still well supplied with stores and are in good condition. In some areas this may not be true and a few pounds of food given to colonies during periods of critical need will pull them through the late winter and spring when they may otherwise die. □

Bees and Gardens

FOR SOME TIME, since I began this column in May of 1982, there have been numerous references to "pollination" and its importance in plant reproduction. While pollination, in itself, is a somewhat mechanical process (the physical transfer of pollen from stamen to pistil) the pollination-fertilization reproduction progression involves complex biological activity. Fertilization includes cellular biology, genetics and other plant physiological processes among the botanical activities in this seed-producing cycle. The end result is a fusion of sperms and egg in the flower ovary, producing the embryo for the next generation of plants. Embryo growth follows seed germination.



Pollination in salvia (*Salvia pratensis*). A) Arrow points to plate formed by fusion of bases of the two stamens. B) Pressure against the plate (indicated by arrow) causes anthers to tip forward. C) Bee pushes against plate, anthers tip forward and deposit pollen on back of bee. D) Bee visits older flower. The stigma has now grown downward, the lobes open, and the bee brushes against the stigma that receives the pollen.

Pollination

Nearly all of us who are hobby beekeepers have at least one thing in common that should make us feel better about our contributions to society. We are contributing some very important free services; namely, the pollinating activity of our honeybees. So, if you do not contribute heavily to charities at least this act of hobby beekeeping will be a credit to your celestial account (but don't try to list this contribution in your income tax list of charitable causes!)

What is this "gift" of pollination which your bees provide? Let us begin our discussion of pollination-fertilization with a short discription of what takes place when a flower produces fruit/seeds.

Flower Structure

A flower has the following parts which are essential to reproduction: The stamens, which bear the pollen; the pistil, on which the pollen is deposited and pollen tube growth takes place; and the ovule, where fertilization occurs. The petals and the sepals are supportive in the pollination process, attracting pollinating insects. Large, prominent and colorful petals generally evolved along with the need for insect pollination, although this is not always true. A flower may be complete with all of these parts or incomplete, with either the stamens or the pistil missing. The flower is then referred to as male (stigma missing) or female (stamens missing).Sometimes a plant may have male and female flowers on separate plants, or a plant may bear both male and female blossoms on a single plant.

Regardless of the type of flower, a transfer of pollen must take place, from stamen to pistil. Wind may do it if the pollen is light and fluffy, but if the pollen is sticky, insects are needed, and the honeybee is generally the best pollinator.

The Bee as a Pollinator

Honeybees are very good pollinators since they have been working at it for perhaps over a million years. Flying from flower to flower, the bee gathers pollen on the rear pair of legs. We can discount this

(Continued on pg. 78)

Cook & Bake With Honey

By AMOS ARBEE

By AMOS ARBEE

The use of honey in cooking and baking can spell lots and lots of enjoyment and fun providing one is willing to become adventurous now and then disregarding attention to details in respect to exact measurements etc.. In fact some real great recipes can come about with this particular phenomenon in mind. So next time you are baking or cooking your favorite recipe just keep this in mind and place some honey in it. You may be truly amazed at the end results you are able to acheive. Now for another favorite recipe:

"Peanut Butter Honeys"

Sift together & set aside:
2½ Cups sifted flour
1 tsp. baking soda

Place the following in your mixing bowl creaming very well:

1 Cup chunk-style peanut butter
½ Cup butter
2 tsp. vanilla

Add gradually creaming well after each addition,

½ Cup sugar
1 Cup honey

Add in thirds, beating well after each addition:

2 eggs well beaten

Mixing will blend the dry ingredients in fourths to the creamed-mixture. Drop by teaspoon on lightly greased cookie sheets and bake at 350 degrees F. for about 10 minutes.

Hint: Will keep well for quite a while in tightly covered container, (providing you have no cookie mosters in your household)

Pure Honey

Accept

No

Substitute

Bees and Gardens

(Continued from pg. 76)

gathered pollen as a major contribution to pollination effectivness. For one thing this pollen is inactivated by the bee and secondly, this pollen is destined for use by the bee. This leaves the loose pollen grains carried on the hairy body parts of the bee to accomplish the pollination work. As the bee moves from flower to flower, gathering nectar or pollen, she scatters pollen grains about, some of which reach the stigma of the flower and germinate. The germination produces a tube growth through the stigma, enters the ovary and the ovule where fertilization takes place and seed is formed. The pollen tube carries the male gametes to the ovule where uniting with the egg takes place.

I don't know if it is obvious from this brief explanation but it is a fact that this transfer of pollen from stamen to stigma, pollen tube growth and fertilization must take place for every single seed formed. If you count the number of kernals on an ear of corn or the number of seeds in a watermelon you have an idea of how many visits by bee, or wind activity, is needed during the blooming periods of many of our major food plants.

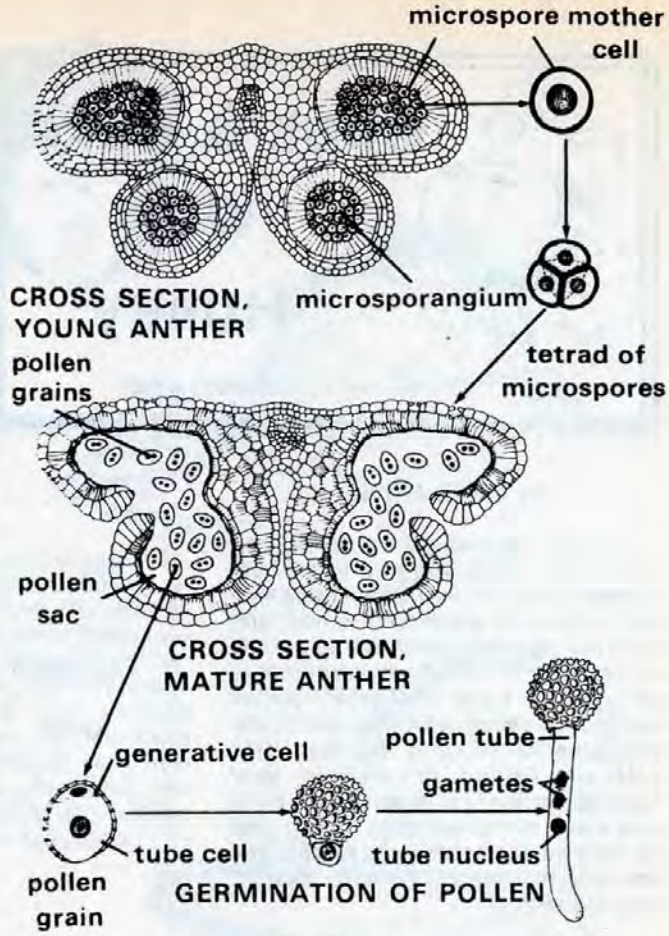
Many of our food plants, including most of our fruit and vegetables, depend on insect pollinators. Even if these plants do not need honeybees to produce the edible portions in our gardens, such as carrots, beets and lettuce, you can be certain that honeybees are likely involved somewhere along the line of seed production. The role of honeybees in tree and small fruit production is perhaps known but not always fully appreciated by the consumer and I believe the same can be said of some of our common vegetable crops.

Some food crop plants flower and fruit without assistance from honeybees, being pollinated by wind and/or because they are self-fertile, able to use their own pollen. In some instances, such as is the case with self fertile varieties of peaches and some tart cherries, bees contribute to increased quality of the fruit. This is very evident in raspberries, for example, which attract bees gathering nectar.

On other plants, insect pollinators are absolutely necessary and honeybees are the most important pollinators at present. Before honeybees were introduced to America the native insects were much more numerous, but poison sprays and clean field cultivation have cut these populations considerably.

Orchardists hire colonies of bees to pollinate, especially those who have many acres of apples, plums, pears, cherries and almonds. Growers of small fruit as raspberries, blackberries, blueberries and cranberries find that bees are essential to get maximum production. Truck gardeners need bees to get crops of watermelon, squash, pumpkin, cucumbers and musk melon. Some vegetables such as eggplant and peppers bear better with bees to pollinate the blossoms. Of course we must remember that to obtain the seed to sow our gardens bees must pollinate the seed crops of most vegetables, including such important

(Continued on pg. 80)



The anther and pollen grain. Each microspore mother cell within a microsporangium divides, forming a tetrad of four microspores that shortly separate. The nucleus of each microspore then divides and a tube cell and generative cell are formed within the wall of the microspore, which is thus converted into a pollen grain. Following pollination, the pollen grain germinates, producing a pollen tube, and the generative cell gives rise to two male gametes.

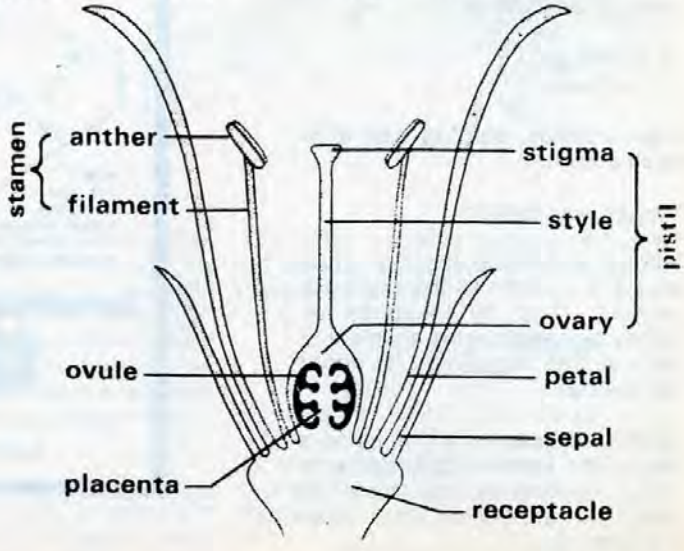


Diagram showing floral organs.

Siftings

By CHARLES MRAZ
Box 127
Middlebury, VT 05753

(Continued from page 72)

seriously considered by those interested in the theraputic or health value of the various bee products. I do not have much experience with pollen in the diet, but I do use it myself and sell it to those that want it. I make no claims for it and there is no scientific evidence of its value in the U.S. at least, though considerable research has been carried out in European countries.

Personally, I question the need of scientific evidence in such cases with natural products. For the past several years, many people have told me of the value of pollen for lowering high blood pressure, sometimes even when drugs did not prove helpful. At least pollen is harmless while some drugs can cause serious side effects, especially kidney damage. Others have told of the great relief pollen has given them for prostrate problems and asthmatic conditions. One thing is certain, a teaspoon of pollen a day is a lot cheaper than a heart attack or a prostrate operation, and worth trying. At least no harm is done if you try it. Anyone that tries pollen along with honey in the diet, should have some interesting results. As with Dr. Jarvis, the only way we can learn to keep healthy with these "Folk Medicines", is to try them. Dr. Jarivs tried them not only on his patients, but also on animals. The best "scientific proof" there is, is what it will do for you. If bee products such as pollen and honey can make and keep you well, that is all the "scientific" proof you need. □

(Continued from page 68)

Alabama. Brood rearing has been almost continuous with most colonies having 3-5 frames of hatching brood at end of December.

Region 7

Bees have been using up stores in Oklahoma due to warm weather. Plenty of moisture. Bee pollen sales better than honey sales. Don't look for much increase in colony count in 1983. Very little local honey left to sell in East Central Oklahoma. Very wet in Arkansas. Bee colonies have been lost in floods. Bees have plenty of stores in Texas but bees flying almost daily. Recent rains give hope to a promising flow in spring. Honey sales good with most of 1982 crop moved out to retail stores.

Region 8

Winter variable with alternating pleasant and cold days in Montana. Bees are wintering well but the warm days will cause heavier use of honey because of the opportunity to fly. Heavy snows have covered most of the beehives in Colorado but the bees have good amounts of honey on hand. Honey sales have been good over the holiday period and home use of honey appeared to have increased.

Region 9

Honey sales are slow in Oregon but should pick up after the New Year. Weather has been moderate. Bees in good condition.

Bees and Gardens

(Continued from pg. 78)

ones as beets, radishes, lettuce, carrots, onions and the cole crops such as cabbage and turnips. This seed is grown in the warmer climates of California and Mexico, where bees are used extensively for pollination.

Such field crops as wheat, corn, oats and rice do not need insect pollination, being wind pollinated. Soybeans are generally self-fertile, but some varieties benefit from having bee pollination while the bees are gathering nectar. Grasses do not, as a rule, need insect pollination.

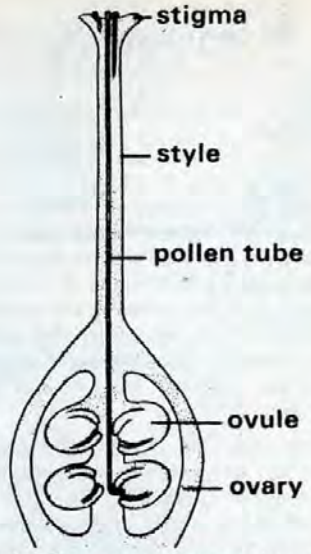
Among the important plant groups which require insect pollination are many of the pome, stone and small fruits; the legumes, including the clovers; certain vegetables such as the cucurbits and cole crops; oilseed or fiber plants as rape, cotton, safflower and sunflower; and such field crops as buckwheat. Many ornamental herbs, trees and shrubs, both cultivated and wild are dependent wholly or are benefited by insect pollinators, when it is necesary to have seed produced.

The legumes, used for pasture and hay nearly all require cross pollination to form seed, but will, of course, produce a crop of hay without bee pollinators; if you have the seed to plant. Alfalfa seed growers, especially, hire many thousands of colonies of bees to pollinate large acreages of seed alfalfa in the western states. As many as four or five colonies of bees per acre may be used to obtain maximum yield. Alfalfa seed plants bear seed in about direct proportion to the number of bees which visit the blossoms. Alfalfa presents some unique problems to foraging and pollinating honeybees, which may drive some of the bees away to other nectar sources nearby.

The Role of Pollination

Many city dwellers and non-beekeepers take our abundant food supply for granted, not realizing the important role played by pollinating insects such as the honeybee. Even people engaged in growing food crops need reminders that poison sprays, which they often use, may be lethal to bees which are on their crops to do the very important job of pollination.

As beekeepers we must help to educate others to the importance of the honeybee in our food economy. Not only do honeybees produce honey, wax and pollen but their pollinating activities are of a far greater value to our agriculture, not only increasing the quantity available but also contributing enormously to the quality and the variety of plant products. Plants make great contributions to our economy by furnishing fiber, fuel, home construction material, medicines and industrial products. Often unknown is the role of pollinating insects, especially honeybees, in the growing of these essential crop plants and other wild or domesticated plants which benefit wildlife or our environment.



Germination of pollen grains on the stigma and growth of a pollen tube to an ovule. Diagrammatic.

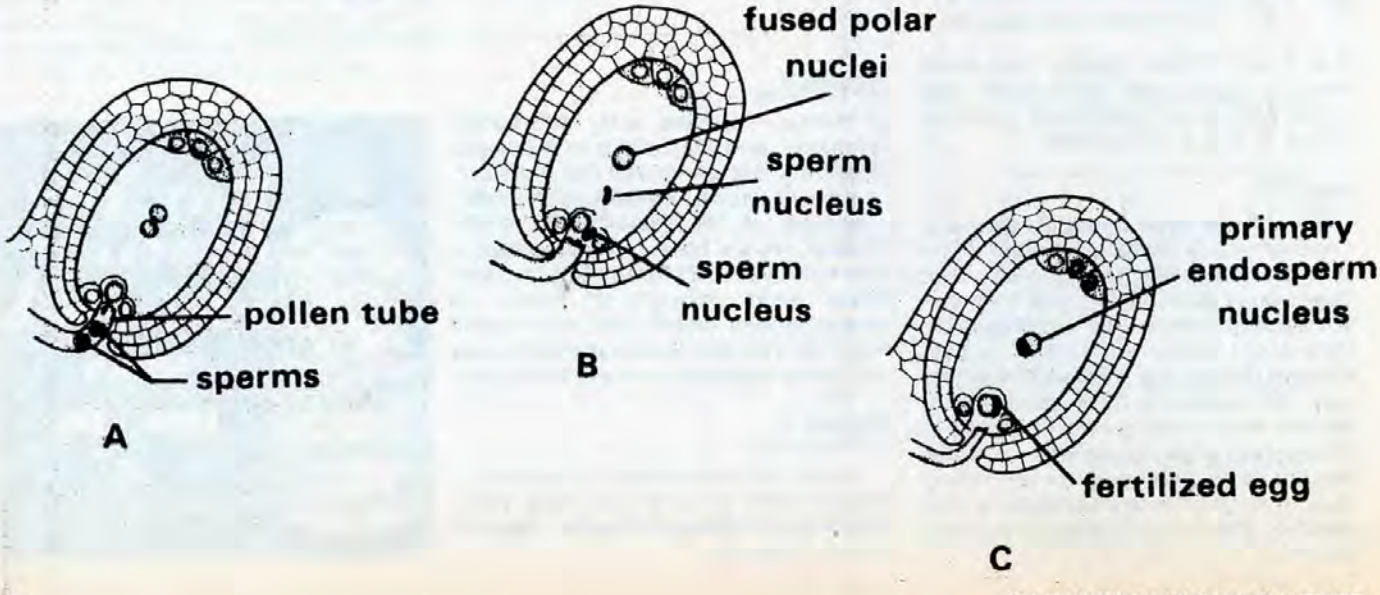
Lastly, a note about recent developments in pollination technology. Certain food plants lend themselves to hybridization. Corn is our best example of hybrids increasing production. Growing hybrid cotton, soybeans, vegetables and flowers involves rather complicated breeding procedures in which honeybees are used. If the future of hybridizing food plants becomes widespread many more thousands of honeybee colonies will be needed than are presently being used in pollination.

L. Goltz

References

Loomis, W.E., Wilson, C.L. *Botany,* 4th Edition. Holt, Rinehart and Winston, New York, NY.

Double fertilization. One sperm nucleus fuses with the egg nucleus, the other with the polar nuclei.



Questions and Answers

Q. I am a backlot beekeeper here in R. Island. I have been reading about bees for several years; however, there is one piece of information I haven't been able to locate, that is, how early in the spring can a queen be shipped from the South? M. R., RI

A. Shipments of queens from southern Florida can begin in late January but of course it is not possible to introduce a queen with any fair degree of succes until after the weather has settled down and the bees have begun brood rearing and nectar and pollen is available in at least token amounts. This is most likely in the middle of late April at our latitude; later in the northern states. If the queen is intended for making a division of an over-wintered colony, the same precautions apply, it usually being early May before the parent colony is of sufficient strength to be divided.

Q. Has there ever been any research on how much heat it would take to kill different types of bee diseases that remain in the hive from a diseased colony? I realize that heating wood to a high temperature can take all the moisture out of the wood and possibly cause warping, but is is a chance that one has to take. I have read that torching the inside of the hive sterilizes the hive but what about the frames? I read in the question and answer column of the November issue that 225°F does not kill foulbrood, but it does not say what heat will. There is a lot of room between 225°F and a torch flame. It seems to me that some bee laboratory could take disease spores of different diseases, put them on wood, and find out what temperature it would take to kill the spores short of setting the wood on fire.

It seems to me if someone had an oven big enough to insert a complete hive, frames and all, after a thorough cleaning of wax and heat to say 350°F for ½ hour would do it, but I don't have the necessary equipment to check the results. R.D., NJ

A. Experience has shown that the only practical method in the field of sterilizing wood is to char the wood surface as is done when an infected hive is treated for foulbrood. This treatment can only be used on the covers, hive bodies, supers, and bottom boards. The frames, combs, bees and honey are not salvaged in the process. Apparently a high temperature is required to kill the spores of foulbrood causing bacteria, too high to be tolerated by any material from which hives are made. The only way that sterilization can be attained safely on bee hives without destroying at least part of the material is to use a combination of heat and chemicals in a pressurized chamber. This is exactly what the latter part of your letter suggested. While such methods are presently being used and apparently successfully, there remain several problems with the possible side effects of the chemical, ethylene oxide, being used.

Q. I would like to know if I can feed my bees honey in the spring which is good but is almost black in color. What is the best way to do it? Should it be thinned ad could I pour some on each inner cover? It's hard to sell the very dark honey and I had a bumper crop this year. O.N., OH

A. Feeding the darker honey to your bees woul be a very good use for your surplus honey. Wait until the bees are beinning to fly occasionally in the spring if possible. Since the honey is from your own bees you will know if it is disease free, a precaution that must be observed for any honey fed to bees. It would be best to feed the honey in some form of feeder rather than trying to pour a small amount on the inner cover. If the honey is granulated it may be necessary to heat and melt it before removing from the container. It may not be necesary to thin the honey with water to feed, but if you do, use only a very small amount of water, no more than a cup full to the gallon. Thinning the honey with water increases the possibilities of it fermenting in the feeder.

Q. I have a problem. I have not heretofore had American Foul Brood, if that is what I have now. I had 11 colonies and this one in question was not doing very well. By that I mean they had very little stores on hand to go through the winter. So I blamed the queen and killed her and united the bees with another hive. A few days later I was cleaning up the recently empited hive, and I noticed a peculiar odor. It smelled to me just the inside of a chicken house. That is chicken manure, damp feathers and mulching, etc. then as I examined it more, there were more signs of AFB. Now I've got one full body and frames, plus the united hive and super, all suspect. What should my next move be? Any advice appreciated. G.L., KS

A. Your first move should be to contact your local bee inspector and arrange for an inspection of the bees and combs as soon as the weather permits. If you do not know the name of your local bee inspector contact your county Agricultural Extension Agent or the State Apiarist as listed in the April issue of *Gleanings.*

The musty odor may have come from moldy combs or debris rotting in the hive rather than disease but since you mention other signs of a diseased condition, your suspicions of having a brood disease may be correct.

Your apiary inspector will take corrective measures to eliminate contamination if disease is present. Treatments vary between states, ranging from the use of burning to sterilization in fumigation units. Recommendations may be given to use chemicals to prevent further spread of disease among healthy colonies. Meanwhile, do not feed any of your honey to your bees or exchange any combs or hive equipment between colonies or allow equipment to leave your possession. Keep all equipment not occupied by bees stored in a closed building which is bee tight. Remove any dead colonies in the apiary immediately and store in the bee tight building. Do not clean out the empty hives and leave the trash laying about but bury it so no bees can reach it.

If an inspection is not immediately possible of the suspect equipment, cut a 4″ square section of comb which contained possible diseased brood, wrap it in waxed paper and mail in a sealed cardboard box to the Bioenvironmental Laboratory, Room 200, Bldg. 476 BARC-East, Beltsville, MD. 20705. An analysis of the piece of comb for the presence of AFB will be made and the results sent to you.

Finally, ask your apiary inspector for recommendations about protecting the healthy colonies in your apiary should disease be present in one or two colonies or some of the equipment contaminated.

How to . . . Load and Move Bees

By THURBER

(Part 2)

Making Top Screens and Entrance Screens

I HOPE YOU never see a hive melt down because it was closed up and inadequate ventilation provided. I not only saw a whole truck load of about 60 hives melt down which was shocking and depressing, but I also had two of my own hives melt down due to an unforseen accident. A friend came by with his unscreened hives loaded in his pick up. By the time we loaded most of my screened hives I was afraid that the springs would not carry the load of the two remaining hives which were the biggest and heaviest. Therefore I left them with top and bottom screens on them with the intent of coming back in three or four hours and move them. What I did not realize was that many bees from my friends hives were left behind when we pulled out. The lost bees clustered on the top screens and on the front of the entrance screens effectively smothering the two big hives. What a heartbreaking sickening mess! Honey, bees, and beeswax ran out of the entrance when I pulled the bottom screens. I tell you this as a warning. You should never expose screened bees to unscreened bees, and you should never mix screened and unscreened bees on the same load.

Now why screen bees anyway? Obviously you do it to keep bees in their hives. It is nice to be able to load bees at night, but move them and unload them in daylight. Yes, I know commercial beekeepers often move their hives unscreened, but they think it is cheaper to move that way and it maybe is if they do not have to pay overtime for night work, and if they do not get stopped or their truck does not break down and then get sued because their unscreened bees panic people and/or go on a stinging spree. Anyhow a substantial number of hobbyists and sideliners live in the suburbs or in a city, and I do not think it is smart to drive through any city with unscreened bees. With traffic signals forcing one to stop and start, and street lights to attract bees, incidents can and have occurred. So screens for hobbbyists and sideliners and nets for commercial trucks I think should be used. Furthermore, I think the handwriting is on the wall. Every "bees-on-the-highway" incident leads us closer to compulsory screening or netting. Face it — bees can be and have been banned from some cities, they could also be banned from the same city's highways. That we do no need!

Now most top screens do not work with the tops on, and most screens do not let you add water to the hive when the screen is in place. Both these features I think are critically necessary. Now look at the illustrations. You will note my top screens are made only 3/4 of an inch high plus the ½ inch thick triangles which provide space above the screening (actually 1/8 inch hardware cloth) when the migratory top is in place. This 3/4 of an inch height is suitable for the coastal areas of Washington and Oregon and the New England states. It is not suitable for areas where it is hot in summer — in the Dakotas for example I would make my top screens at least two inches high plus the triangles. In the Gulf states and Arizona, New Mexico, and California I would make them four inches high or more. If I had shallow supers I might turn them upside down and nail on the screening and then the triangles. These would be fine top screens. In fact one couple did exactly that when some idiot sprayed SEVIN on apple bloom two houses away from their bees at their suburban home. As she said, "I threw a wet bed sheet over each hive then we nailed screen and triangles on a shallow super madly. That night we put the screens on, and took the hives to a friend's home out in the country."

Another source of wood for top screens could be that stack of beat up old supers you have been saving thinking you would renovate them some day. All you need is a nail cutting blade for your table saw, and you can cut them to any depth you think appropriate to your climate.

Now let's go back to mine. I have a jig made out of chip board, and a few three quarter inch square strips which I nailed to the chip board. I then lay my cut to length pieces in the jig which holds the strips in a true rectangle 16¼ x 20. Then I staple on the hardware cloth, then nail on the triangles at each corner, then the triangles at the center of each side, and finally I add the cross piece and nail them to the center triangles.

The box entrance screens I think were devised by the now deceased Dr. John Eckert or Dr. Harry Laidlaw at the University of California, Davis. I

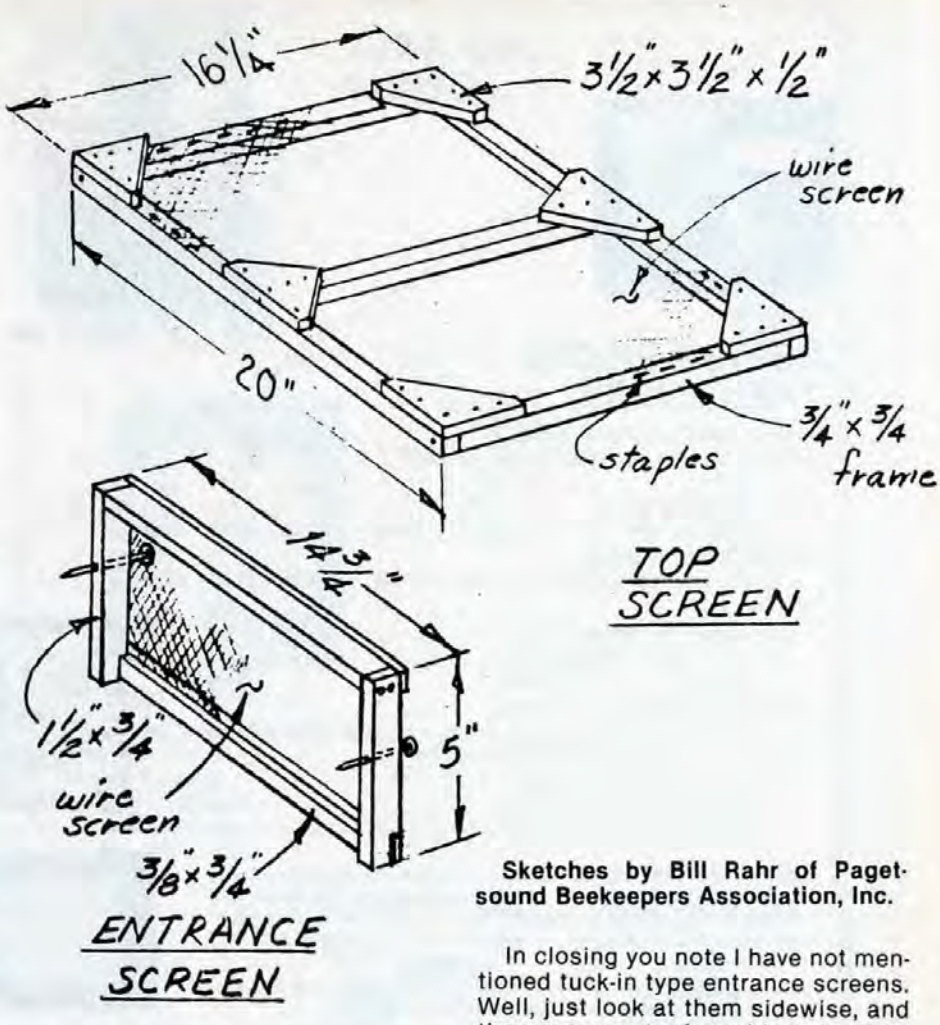
Top box entrance screen below ventilating top screen then bottom board with non slip modified form nails with paper over the nails so they show up. And on the bottom board in front an AGM-cargo tie and to the rear an Air-equipment ratcheting buckle with 1¾ strap. The piece of strap iron is the cheater bar for the cargo ties.

think they need no description. However, you may have some slight variation in the distance between the rails of your bottom boards so perhaps they should be made a bit less than 14¾ inches long, and if they are in use a bit short, you can stuff a wad of grass in where necessary before nailing on the front screen. You can suit yourself about nailing on the top screens. I do not. I strap my hives so hard the tops and top screens do not shift, but if you nail, only nail on the sides of the top screens. You do **not** nail on the ends because you risk splitting out the rabbets (frame rests)!

Now a couple of more things. Bottom screens to work have to be set into bottom boards that do not slip when you are man handling on and off the truck. Glen Stanley, State Apiarist for Iowa, and Jim Powers, who I believe has more hives than anyone in the USA, use metal right angles nailed to the bottom boards, and they are placed so that when you set a super on the bottom board the four right angles projecting upward touch the super both at the corners of the side and on the ends. For sure those supers cannot side off the bottom board. Well, I do not know where to buy those right angles, and I am not about to make them so as an alternative, what I and many of my friends do is buy number 6 double headed nails. Some people call them form nails. We grind off the upper head and bring the nail to a point. Then with a piece of say half inch rod with an eighth inch hole drilled into the end of it, we place the sharpened nail head in the drilled hole and then hammer on the rod. We random space four of these nails two on each side of the bottom board. When we crunch a super down on those nails, they do not slip.

Two more tips — first, if you decide to nail on your top screens, and do not use the biggest nails you can find because you have to remove the screens after you get the bees moved. I think with three quarter inch high screens number 4 box nails are long enough. With deeper screens use longer nails but by all means use box nails not common nails.

Second, the height of the Laidlaw box entrance screens is up to you. If you install lift cleats on all your boxes, you will probably carry hives by holding onto the cleats on the second brood body, but when you lift the hive onto a truck particularly a 4-wheel drive truck which is a high lift, leave a full inch between the top of the entrance screen and the bottom of the lift cleat. You need that much for finger space. If you buy or make a pipe hive carrier, you will need that much space too.



Sketches by Bill Rahr of Pagetsound Beekeepers Association, Inc.

In closing you note I have not mentioned tuck-in type entrance screens. Well, just look at them sidewise, and they move out of position. Furthermore, bees usually die trying to get out using them. They do not normally crowd the box entrance screens. So there — that is why! □

Book Review

Mr. Buzz the Beekeeper by Allan Ahlberg, illustrated by Faith Jaques is one part of the Wacky Families series and is a Golden Book published by the Golden Press, New York, Western Publishing Co., Inc., Racine, WI, 1982.

This small child's book is beautifully illustrated. It is about a swarm of bees that the beekeeper, Mr. Buzz, loses and that finally returns home to an empty hive on their own.

I found this book for sale in a local discount department store, Heck's, in Richmond, KY for under three dollars.

James Steed

The Bee-Hive, An Enquiry into its Origins and History, By Dorothy Galton. This little book, the result of several years' research and much cogitation, is being published privately by the author. It uses the vocabulary of the tree and the bee in various languages, and illustrations drawn from various sources, to suggest a continuity in the development of the hive from the Stone Age up to ancient Greece. Twenty-four pages of drawings.

The book does not deal with the hive in the Christian era and myths about bees and beekeeping are not discussed.

The edition is limited to 500 copies. Price, $3.50 English pounds including postage.

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Beekeeping Ordinances

By BARRY SEMEGRAN
Dacula, GA

THE ATLANTA JOURNAL, a while ago, ran an article concerning the topic of ordinances restricting beekeeping in Gwinnett County, Georgia, a suburb of Atlanta, and my attempts to fight those restrictions. The issue has been settled for now, but the whole affair has prompted me to reflect on this predicament and to report my finding to you, my fellow beekeepers, because you may face a similar situation in your home town.

It began one morning in April when one of my bee supply customers came to return some items he had purchased recently because, he said, the county was asking him to move his beehive out of his yard. Evidently, a neighbor called the Planning and Zoning Department (P&Z) to complain about the beehive and the beekeeper was told that no beehives could be kept in any part of Gwinnett County except in zoning RA-200 (the agricultural sections). The complaint was made in February, the coldest part of our winter when bee flight is minimal.

I was stunned by this news because I had worked hard for eight years to build Bee-Jay Farm, my cypress bee supply manufacturing business, and even though I sell my hives all over the U.S., I still have a good number of Gwinnett county customers. That same day I made it my business to go to P&Z and speak with the director. Apparently, the P&Z Appeal Board was asked for an interpretation of present farming ordinances and it was decided that those existing ordinances were to be read to include the exclusion of beekeeping from all residential areas. In this way beekeeping could be restricted without the need to write any new ordinances and save all that trouble of presenting it before the elected officials for passage. It looked like I was about to fight the proverbial "City Hall".

Like so many other Americans, I knew where City Hall was located, but I had neglected my duty as a citizen to keep up with county affairs. So I did the following: Got lists of all county officials, filed an appeal with the P&Z Appeal Board, and notified every Gwinnett County beekeeper whose name I had in my files to both call their officials and to be at the appeal meeting. At that meeting I argued for the mulitude of benefits honeybees provide us and tried to argue away the apparent basis for complaints. The heart of the complaint(s) was the fear that children in sub-divisions may wander into a neighbor's yard and be stung by his bees. I say the "heart" of the complaints because I was not allowed to see the complaints even to the extent of finding out if they involved actual stinging or just the fear of stinging. It amazed me at the time the strength this argument had with the county officials; only later did I realize the larger issue underlying their concerns over sub-division type problems in a largely rural county — namely, not impeding growth and development. It seemed ludicrous to me and I told the P&Z Appeal Board so, that they would restrict citizens rights to keep bees in their backyards in an attempt to protect trespassing children. If those children are old enough to be out on their own, they are old enough to know not to trespass. If they are too young to know this, why are they not under their parent's supervision? I reminded the county officials of the many young people in our county who keep bees for Boy Scout or 4-H projects and the hardships their restrictive interpretation would have on these creative, energetic, and knowledge-seeking youngsters. I urged them to consider this more than the "protection" of the unsupervised, wandering children in sub-divisions.

The one big mistake I made was to invite both letters and personal appearances from state and local beekeeper organizations without insisting that they make no mention of types of restrictions that could be placed on beekeepers. The county had taken a hard line in restricting bees from most parts of the county and I, in turn, stood for the opposite hard line of no restrictions. If a beekeeper kept too many hives in one location, for example, the case should be handled individually just as any other nuisance complaint invoking already existent nuisance ordinances. Oddly enough, I was branded a radical for this stand. I was amazed to find out that one could be called a radical for merely wanting a return to the **status quo!** The state and local beekeeper organization officials made the mistake of mentioning restrictive measures which had been adopted elsewhere as compromises to outright restriction. The county P&Z jumped on these measures like bees on an exposed frame of honey during a dearth of nectar. The P&Z Appeal Board decided to throw the issue back to the regular P&Z Board so that they could write up a new ordinance requireing perhaps fences around beehives which must be kept a certain distance from property lines. I was fuming mad at those I had called upon to help me for giving ammunition to the other side at the first sign of battle. Now, I faced a new fight before the P&Z Board.,

Your own community may have different laws and practices, but in Gwinnett county the P&Z Boards are comprised of a paid staff of officials and the actual members of the boards are political appointees of the county commissioners. Although P&Z writes the ordinances, only the commissioners can adopt or put into effect those ordinances. Ultimately, I would have to face this issue with the county commissioners, but until then I began to attend all P&Z meetings since I did not know at which one they would bring up the bee ordinance. It was spring and I was extremely busy with my bee business, both manufacturing hives and making up nucs for sale, so at one particular meeting I stayed from 9A.M. to about 10A.M. until a five minute break was called. (County business seems best conducted while most citizens are busy working). I then went up to ask some of the P&Z Board members if any discussion of bees was to take place at this meeting and I was assured that it was not on the agenda. So I left. I was, therefore, surprised to read in the next day's county paper that I had been appointed to a committee by the P&Z to work on the bee

ordinance. To this day I have never been notified of this appointment and can only assume that P&Z was going to write some restrictive ordinances and then argue that they were not counter to bees or beekeeping because I was on the committee that wrote the ordinace. They were merely going to use my name without my input. I was slowly learning that when you attempt to fight City Hall you had better get ready to roll with the punches.

The local County newspaper, the *Gwinnett Daily News,* covered the proceedings at the P&Z meetings and in this way helped organize the other beekeepers in the county I could not reach. But, also, right at the same time the P&Z was working on bee ordinances, the *Daily News* ran an article about African Killer Bees! Their timing was perfect to add to the level of fear about bees. I began to ponder the reasons behind this type of "journalism" and political manipulation.

Rather than wait for P&Z's final decision, I decided to present the case for the bees before the county commissioners themselves (always using the word "honeybee" instead of "bee" in front of non-beekeepers). The various points I made before the county commissioners appear in the insert below.

The case was so overwhelming on the side of the bees that all the commissioners agreed that they were not interested in passing any ordinances restricting beekeeping in Gwinnett County. In this way I was able to bypass P&Z and save another fight. The immediate battle was won, but I knew the war had only just begun.

Of the 159 counties in the State of Georgia, Gwinnett ranks first in growth and development or what the county officials call "progress". The trend is to pack people into this county so tightly that even one hive of bees might have a hard time doing their thing without being a nuisance to neighbors. The pieces began to fall into place. The real problem wasn't the bees; rather the bee issue was merely an indicator of the problems that arise from accelerated growth. Gwinnett's P&Z exists to increase growth, not to discuss whether there will be growth or not. In fact, no party involved in our county government can point to any facts and figures to show that growth and development helps any but those who get rich through it. It's effect on the tax base seems clear to me — the more development, the more taxes. The county commissioners even gave over $32,000 of the taxpayer's money to the local Chamber of Commerce to help defray costs of encouraging new industry and business into the county. Through this growth, development, and "progress" we lose our proud heritage of small family farms to subdivisions, the beautiful trees and woodlands to the developer's bulldozer, and in general, we lose our feeling of oneness with nature and the land to the senseless and destructive lifestyle associated with more developed areas. But in your fight with City Hall remember the paper and the politicians both benefit directly from growth and development.

I suspect Gwinnett County is a lot like other communities all over the U.S. and it is my hope that my discussion here may be of benefit to other beekeepers in similar situations. The beekeepers of Gwinnett County have temporarily retained their right to keep bees. But, I have learned that we are slowly losing more than just the freedom to keep our bees, we are losing the very way of life which makes the joys of beekeeping and of living close to nature possible.

Points made at County Commissioner's Meeting

1. Thank Commissioners for listening. Will yield to other speakers.

2. Opening remarks — explain how honeybees are essential for pollination for many fruits and vegetables, whether it be farm or backyard. We need to encourage, not discourage beekeeping by making it harder or more expensive.

3. Many moved to Gwinnett in order to have a little elbow room and breathing space — to get away from the restrictions of urban or suburban living. Even now in Atlanta, anyone can keep honeybees anywhere (within nuisance regulation guidelines) — but not in Gwinnett if you accept any P&Z restrictive suggestions, such as fence requirements.

4. We have many other stinging insects in our county and many people do not know the differences between a honeybeé and a yellow-jacket or wasp. But the word "bee" is used in all cases and therefore the honeybee gets most of the blame. If the problem is in county parks, then it is more likely to be yellow-jackets attracted to food and trash around picnic tables, etc.

5. Argument about wandering children and the youngsters who keep bees.

6. Bees are the official state insect of Georgia — recognized because of their importance to our lives and well-being. Must we be a leader of Georgia counties in restricting beekeeping? Are we being progressive or repressive.

7. People who keep honeybees provide a valuable service (pollination) to their community and therefore to their county as well. They should not be discouraged in any way. Should a dispute or complaint arise, it should be handled as any other nuisance complaint. We need to not just shelve P&Z's plans for now, but make the record clear that the Commission is aware of the place of honeybees in the overal scheme of things and prefers to let neighbors go on with the business of living civilly together and being left with the freedom and flexibility to work out problems on a one to one basis. □

New Publication from IBRA on Chalk Brood

Beekeepers in many parts of the world have been concerned about recent outbreaks of chalk brood, and the International Bee Research Association has now published an authoritative reprint by Dr. L.A.F. Heath, of Plymouth Polytechnic, Devon, UK.

The reprint contains two articles from the autumn 1982 issue of *Bee World.*

Any beekeeper, whether or not he has a scientific training, will find these articles, written by a biologist, of practical use.

The reprint (M110) is entitled *Reviews: Development of Chalkbrood in a Honeybee Colony: Chalk Brood Pathogens.* It is available direct from the International Bee Research Association, Hill House, Gerrards Cross, Bucks SL9 ONR, UK, price U.S $2.50 post paid.

The Royal Hunt

By SANFORD A. MOSS
Westpoint, MA

In all but the most extreme forms of "let alone" beekeeping there come times when the rational culture of bees requires that the queen be located with certainty. The queen must be found, for instance, for successful requeening, for making divides or setting up two-queen colonies, for certain methods of swarm control and in queen rearing.

Many beekeepers find the prospect of locating a single bee among fifty or sixty thousand others an intimidating task and so shirk the whole business. Others find queens by hook or by crook, and, in the process, spend uneconomic lengths of time and usually end up disturbing their colonies to the point that much of the original justification for finding the queens is lost.

For those beekeepers who are adept at finding queens, the whole business is usually simple and queens are located in remarkably little time. The main trick to find a queen, I am convinced, is a very simple one — know what you are looking for.

Students of the behavior of animals, particularly of predators seeking prey, have developed a concept — that of a "search image" — which explains much of the behavior of predators that specialize in hunting a particular type of prey. Birds, for example, which have learned to identify a particular prey — say a protectively colored caterpillar — will hunt for that kind of caterpillar to the exclusion of other, equally nutritious ones. I am reminded of the search image whenever I spend some time seeking oysters at low tide in estuary near where I live. It takes a while to learn what the oysters look like as they lie covered by a thin film of fine silt with the edges of their shells curled up slightly above the bottom. Once I learn to recognize this, I can retrace my steps along the shore and always find a dozen or so oysters that I missed seeing earlier. After such a hunt I visualize those hidden oysters in my mind as I fall asleep that night. It is then that I best appreciate what a search image is!

This notion of the "search image" can be a useful one for beekeepers who wish to find queens.

If a beekeeper is to develop a search image for queens, how does she or he do it? Pictures can be studied, and books can be read, but there is no substitute for seeing the real thing and spending some time studying it. Pictures published of queen bees often feature the queen surrounded by a "court" of workers intent on getting the queen substance pheromone from her. Consequently, some beekeepers look for a cluster of workers when they search for the queen.

In my experience this is the wrong search image to use. Most of those pictures, I am convinced, are taken of undisturbed bees in observation hives. A good queen, laying well, is on the move in a hive, investigating empty cells and laying eggs in them. It is only when she stops to rest or receive food that a well-defined "court" forms around her. Queens in observation hives have only restricted space for egg laying, and so spend more time being the objects of the workers' attention. Moreover, the disturbance of opening a hive — even quietly and with little smoke — will often send those workers in the "court" to open honey cells to fill up with food. A beekeeper will be more successful at finding queens if the **queen** is sought — instead of the cluster of bees which will probably not be around her.

When I search for queens I look for a large bee — one with a long, pointed abdomen that has a "waspish" look to it. The small eyes and the shiny thorax and other clues that confirm I am looking at a queen, and not just a large worker (if a colony has a particularly elusive queen, it is amazing how big some of the workers can appear).

In many varieties of bees, the queen, in addition to being large, is also distinctively colored. Italian bees and many of the hybrids involving Italian stock are often lighter in abdominal color than the workers, and so tend to stand out. In some strains, such as Buckfast bees, the queens may vary consideraby — some are light, some may be dark, and others may be reddish. Dark races of bees, like Carniolans and Caucasians, can have dark, almost black, queens and are more difficult to find by those using color as a part of the search image.

If a beginning beekeeper has trouble finding a queen for the first time, and developing a search image, the best advice is to find an experienced beekeeper willing to take the time to find a queen for you. This isn't too difficult to do. Most beekeepers I know are more conspicuous than queens, and once found, enjoy taking neophytes through a bee colony.

Aside from developing a search image there are some other hints that can make queen finding less of an onerous chore. First, the hive should be opened with as little disturbance as possible. This is particularly true if the bees get excited easily or tend to run about on the combs. When I open a hive I use little smoke and try to get the brood nest broken apart and isolated as quickly and as quietly as possible. In a double brood chamber hive that has no supers, I will remove the outer cover, then lift off the top brood chamber even before I remove the inner cover. If the queen is in the top brood box (where she most likely will be found) she is thus confined there. She can't run down below while I am working through the frames.

As a general rule, the queen will be in the brood nest. It is not an economic use of time to look first at frames that do not have brood. It is best to remove a side frame to get some working room and then go straight to the frames with brood. Frames that do not have eggs or cells freshly polished to receive eggs can be given a cursory glance. This means combs filled with sealed brood or heavy with pollen. The queen will most likely be where she can lay eggs.

As each frame is examined, it should be scanned in an orderly way with the search image in mind. Some beekeepers like to look down the frame from the top while it is held at a slight, oblique angle. The larger queen, seen from this angle, will rise

above the backs of workers or drones. Other beekeepers look at the comb held perpendicularly and quickly scan the brood area.

After going through the top brood chamber without luck, it is then time to look through the lower chamber(s). If eggs are found there, this is a good sign to go slowly. If no eggs, then after a quick look, go back to the top chamber.

If a second look at the frames is necessary, this time include the side frames, outside of the brood nest. The queen could have been missed before while she was laying an egg when the first search was made, or she could have been on an exploratory sortie out to some frames filled with nectar.

By this time in the search, a beekeeper who knows what to look for will have found 95 out of 100 queens. The problem queens are those other 5. There are a number of conditions that can make a queen hard to find. Some of these are:

(A) There is no queen. If the queenless condition is neither a very recent one nor a very old one there will be no eggs in the hive. If a queen has recently departed with a swarm or been lost there will be an abundance of swarm cells or emergency queen cells. If she has been lost for several weeks there will be several eggs per cell, deposited by laying workers. If any of these conditions are met, stop looking. You have other problems to think about.

(B) The queen is a young queen — either virgin, or recently mated and not yet laying eggs. Young, non-laying queens are generaly small and therefore difficult to find because the usual search image does not work. Moreover, they can be anywhere in the hive. I once opened a hive with two honey supers above the brood chambers and found a virgin queen on top of the inner cover! Young queens are usually active and tend to run, adding to the difficlty of finding them.

If a virgin queen is suspected the best course of action is to close the hive and leave it undisturbed for perhaps 10 days until the new queen is mated and laying well.

(C) The colony is preparing to swarm. In the few days immediately prior to swarming the queen may lay relatively few eggs as she goes on the weight reducing diet which will enable her to fly with the swarm. Also, she will scatter these few eggs throughout the brood nest. She will then be small, active and not as likely to be in the brood nest. This is unfortunate, for this is one time when the beekeeper would surely like to find the queen as a desperation measure to head off swarming. It is worthwhile in this instance to spend some time carefully searching for the queen — provided it is certain that she hasn't already departed with a swarm!

The queen bee which you see in the center of this picture has a white dot of paint on her thorax, put there by the beekeeper so that he can find her easily if need arises. Down inside the honeycomb cells you can see the eggs she has just laid.

It may seem strange to a novice beekeeper but the brood pattern is used as a guide to finding the queen as much as the visual search. The pattern has eggs in the center of the comb with concentric circles of larva and sealed pupae surrounding the egg area (although this may vary with the various stages of brood in a different sequence of positions). By removing one or two frames from the brood nest the beekeeper, looking at the brood pattern, can almost instantly determine where the queen is most likely to be, which in most instances is near the freshly laid eggs.

(D) Nuclei and easily excited small colonies. Sometimes queens can be hard to find in three or four frame nucs. This is usually because these small colonies are easy to provoke into excited behavior and the bees are apt to run. When this happens the queen may even leave the frames and run on the bottom or sides of the nuc box.

(E) Fall queens. Late in the beekeeping year, when brood rearing has slowed, the queens will be relatively shrunken and therefore more difficult to find. It is a definite advantage to adjust the search image and look for a smaller queen at this time of year. Adding to the difficulty is that after the final honey flows are over, bees are fairly sensitive to manipulation and extra care is needed to avoid provoking them into aggressive behavior.

(F) Dark races of bees. Because the darker queens do not stand out from

the crowd as obviously as those of the lighter races, Carniolan and Caucasian derived queens are usually more difficult to find.

When difficulties are encountered finding a queen there are several strategies that can be employed to better the odds. The first and simplest is to close up the hive and come back another day. The queen can be confined to a specific part of the hive by placing a queen excluder between the brood chambers.. Three days later the queen will be in the only hive body to have eggs.

If problems are consistently encountered in finding queens, it is probably a good idea to purchase marked queens; or to mark them personally with a dab of quick-drying enamel or nail polish on the top of the thorax.

As a desperation measure the entire population of a colony can be forced through a queen excluder nailed to the bottom of an empty hive body using smoke or a bee blower to help them through. The drones and the queen will be filtered out, insuring the location of the queen on top of the excluder. This is a drastic procedure and should only be used as a last resort. An excellent beekeeper, Wayne Andrews of Berkely, Massachusetts, routinely passes swarms he has caught through a queen excluder before hiving them. The payoff is that he very often finds several virgin queens in the same swarm, giving him a bountiful supply of nice young queens with which to stock his mating nucs.

After finding the queen it never hurts to keep your eyes open for yet another. Occasionally, a colony will have a sueprcedure queen laying beside her mother. The daughter seems oblivious to her mother — perhaps because the mother no longer secretes as much queen substance (which is maybe why the supercedure in the first place.) This year I had a colony in which the mother and supercedure daughter were laying nicely together on the same frame until I removed the daughter to requeen another colony. The bees promptly raised a new queen — and when she was removed, another! Meanwhile, the old mother continued to lay an excellent pattern, and ran what I like to think of as a queen factory!

There is certainly no need for any beekeeper to find the queen at every inspection. But it is wide to practice this skill until you are confident that the royal hunt — when it is called for — will be successful. When that time comes, truly rational management of bee colonies becomes possible. □

The Key to Happy Beekeeping

By PATRICIA YUNKES
Hiram, OH

At the end of my first summer of beekeeping, I didn't know whether or not I really wanted to continue my hobby. The bees were interesting, and there was a certain pride in having two hives, but there was very little surplus honey that year, and I had gotten stung quite a few times. The docile three pound packages that I had started with now completely filled two deep hive bodies, and had become a really frightening mass of unpredictable, stinging creatures.

I had been under the impression that a veil, suit and gloves meant total safety . . . . and I was wrong. The fact was that I really dreaded opening my hives.

But as the bees wintered, I avidly read all the literature I could purloin from the library as well as several bee magazines and catalogs. Beekeeping was a fascinating subject.

I also went to club meetings and talked to other more experienced beekeepers and learned their methods and tricks for working hives. I learned to be more gentle, to smoke under the cover, and not to jar the hive or frames.

That spring, I started picking up swarms, taking swarms out of buildings, increasing the number of my hives and writing about bees. This all added an aura of excitement and adventure to beekeeping that I had not experienced before. As my knowledge increased, I found myself a member of the seemingly unique cult of beekeepers, people who went where others dared not go, facing danger and sharing the excitement with other beekeepers, telling and listening to their tall tales — all incredibly true — the same as any other sportsmen.

But I was still getting stung a lot. It's true, most of them didn't bother me and I no longer swelled as much, but there were always a few stings that really hurt. Afterwards I could always find where these were; while I couldn't even find the location of some stings, the ones that really counted had left a fairly large hole, as if the angry insect had been drilling for oil on my skin and left an open well.

I still don't know why some stings are more painful than others, perhaps the amount of potency of the venom has something to do with it. Maybe some bees just have larger stingers.

I just put getting stung down as one of the hazards of the business. The particular way I was into bees, catching wild unpredictable swarms, requeening them when necessary, experimenting in trying to raise queens; all made for some strong hives that were not of good humor.

I remember one wild swarm, the first of the season, that I rescued from near the top of a 30 foot pine. They decidely were not docile as 95% of swarming bees seem to be.

My first trip up the tree was to observe the situation and determine how I was going to get them down. On the second trip, I took a box up, secured it to the tree, shook the bees into the box, and beat a hasty retreat. After a timely interlude, I made a third trip to cut a few twigs with bees still on them and shake them into the box, and had to retreat again. A fourth and last trip entailed sealing and lowering the box, then retreating into my vehicle where I withdrew my right glove and counted 17 stings on that hand and lower arm. I didn't count further, but that swarm had nailed me all over. Never have I experienced bees as nasty as those. I attended a dance that night somewhat swollen, and with one eye almost closed as a bee had gotten under my veil and stung me on the temple. The next week there was another dance, and I went to that one with the other eye almost closed. My husband was starting to make disparaging remarks about my hobby.

About this time, I made a wonderful discovery. I needed another pair of gloves, and while I had graduated from canvas bee gloves to plastic laminated ones, I decided to spend an extra $4 and buy a fancy pair of leather gloves. They had ventilation

(Continued on pg. 107)

Honey House

Michigan State University Apiary.

Reprinted from an article by Laurie Wink in ANR, a publication of Michigan State University's Agriculture and Natural Resources College.

MSU's apiary is actually a log cabin which originally served as a meeting place for female athletes. Few people realize the quaint cabin still stands in Minnis woodlot, which has almost been engulfed by the Forest Akers east golf course and the MSU Observatory.

In the days when the university was called Michigan State College of Agriculture and Applied Science (MSC for short), the women's sports program consisted of tennis, track, basketball and hiking and was under the aegis of the Women's Athletic Association. The WAA constructed a cabin in 1928-29 as a resting point for hiking activities and for occasional overnight outings. The women students helped cover construction costs through sales of apples, balloons and chrysanthemums at football games, according to vintage *State News* articles.

The structure is a Scottish-style shanty of cedar logs with a field stone fireplace at one end and an open loft at the other. It was the scene of many soup dinners, sleigh ride parties and other WAA business and social meetings for more than 20 years.

But by the early '50s, the male and female student population had expanded and so had the educational facilities. A women's intramural building on the main campus had supplanted many of the cabin's functions. Some people recall the cabin became the scene of social outings involving men and women students with common interests other than hiking.

Once a recreational retreat for campus 'coeds,' this cabin in the woods is now home for 'gentle' bees.

Be that as it may, the cabin and surrounding three acres became the center of bee research in the fall of 1953 at the request of apiculturist E.C. Martin, who had recently come to MSC from Cornell and found the woodlot to be a suitable setting for his program. Martin made a clearing on the east side of the cabin, where he established his bee colonies, and simply moved laboratory equipment to the cabin.

Few physical changes have been made to the apiary since then, except for a new cabin roof and a cement floor replacing the original floor of barn siding. The cabin has been christened the "Honey House," as proclaimed on a wooden plaque hung above the door. The plaque also cautions readers to "Bee Ware."

It's doubtful whether many visitors venture far enough into the woodlot to read the plaque. Most probably decide to beware at their first glimpse of bees swarming around some 40 colonies in the woodlot clearing. On a sunny afternoon, bright beams of light illuminate the hives like a spotlight on a stage, causing the casual observer to overlook the charming cabin reposing in the shade and to make a beeline out of the woods.

Even golfers — who normally go to great lengths to look for lost balls in weeds and water hazards — rarely go into the woodlot to search for strays. Roger Hoopingarner, who now heads the apiculture teaching, research and extension program, says he finds golf balls at the apiary all the time. "The last ball I found was right outside the door of the Honey House," he says.

Much of the value of the state's 105,000 or more colonies stems from the bees' role in pollinating major fruit and vegetable crops, as well as for the production of between 5 to 6.5 million pounds of honey a year.

"The sale of honey is really important to the state's agriculture," Hoopingarner explains, because the revenue keeps beekeepers in business, and, in turn, insures the presence of enough bees to provide free pollination services.

Most of the state's 5,000 beekeepers are hobbyists who have one or two colonies and are more interested in having fun than making large profits, Hoopingarner says, although there are a few commercial operators with more than 1,000 hives each. Honey sales have declined since the halcyon early '70s, when the natural foods craze stimulated consumer demand for the sweet stuff and nearly doubled the wholesale price. Since then the wholesale price has been stuck at 57 cents a pound while the retail price has risen to $1.20 or more a pound Hoopingarner says.

Michign now ranks anywhere from eighth to fifteenth among honey producing states, depending on the weather in a given year.

"At one time, Michigan was one of the premier honey producing states in the nation," Hoopingarner says. "The Thumb area was a prime spot for beekeeping because of the sweet clover grown as pasture for dairy cattle. Now other forages have replaced clover and the area is planted in soybeans, field beans and corn, which don't require pollination."

Nevertheless, the Michigan Beekeepers Association is still buzzing with activity after 117 years, making it the longest continuously operated agricultural organization in the state. The organization provides educational programs and fellowship for both commercial and hobbyist beekeepers. Members attend an annual meeting during Farmer's Week on campus, where they can hear about the latest apiculture research from Hoopingarner and other members of the Department of Entomology. □

Zygmunt Dyrakacz, Polish exchange student examines bees in the M.S.U. apiary.

The Honey House.

Ohio State University Bee Class

By GRETCHEN RIVES
Xenia, OH

Getting new interested prospective beekeepers to actively maintain colonies of bees is vital to the survival and growth of the honey and bee industry.

Learning to care for a colony of bees can be a rewarding experience for the novice apiarists. But if they are not lucky enough to know an experienced beeman, it can also be a long, frustrating, and yes, even painful process.

We could go to the local library and read what others have to say on the subject or perhaps obtain some agricultural releases from our county extension agent. But the human hands-on contact could be the missing link to a successful hobby or small business operation.

An increasing number of college students at the Ohio State University, however, are discovering a spring quarter class that carries a taste of honey but can also carry a sting.

"Entomology 361, a five-hour class that qualifies as a biological science, is designed to provide students with information on how to care for a colony of bees," Walter Rothenbuhler, OSU professor of entomology and instructor, said."It gives practical experience in caring for a hive, teaches the biological and historical development of the colony as well as the importance of bees in world food production."

Meeting for three lectures, one laboratory and one individual session weekly, the class usually consists of 60 to 80 students, which is an increase during the past few years. "The sudden increased interest in bee culture can probably be attributed to the recent natural foods trend," Rothenbuhler explains.

Meeting at the OSU Bee Laboratory off North Fyffe Road in Columbus, the individual sessions are designed to provide the students with their own hives. Activities include observing and counting bees carrying pollen on several different occasions to interpret "dancing bees", recording the type of plants visited by the bees and the manner pollen and nectar are collected as well as studying a special observation hive to actually diagram a bee dance and its meaning.

In the weekly laboratory, the students are assigned an individual colonly to work and make management decisions, such as whether to add another super to the colony or if a disease needs to be treated. This session also includes demonstrations, displays and films to round out the students understanding of the industry and the biology of the bee.

Topics include extensive coverage of disease. key points to observe when working with a hive. and where to purchase or how to build equipment.

Two special assignments that are favorites of the students include building five bee frames that will eventually be used by a local Ohio beekeeper and extracting honey from the combs on the last day of laboratory which results in many sticky fingers and happy smiles!

Currently, OSU officials are planning for a new $400,000 facility that will be located in the southwest corner of Ohio State's West Campus and is to be completed in 1983.

Funding for the new laboratory is expected to be allocated by the Ohio Controlling Board, based on the state's 1982-1983 Capital Improvements Bill.

Lynn Mishler, a senior majoring in Animal Science from West Milton and a former student in the class, had previously worked with bees, but recommends the course to anyone with even a slight interest in apiculture.

"I especially liked the course description because of the actual working with the bees in their hives," Mishler explains. "Each of the students had their own hive and had to find the queen, check the pollen and even build their own frames from kits. It was very practical and prepared you to begin keeping your own hive of bees.'

Students previously enrolled in the course include some from agriculture, veterinary science, music, engineering and political science with a number of them beginning their own beekeeping projects upon graduation.

"You can learn so much in the class," Mishler says, "that I plan on starting with two hives of my own. Of course, I will have to explain to my Dad how to care for them until I get home."

"The 150 to 300 colonies of hives at North Fyffe Road are primarily used for research," Rothenbuhler says, "with an emphasis on bee genetics and behavior." Cared for by work-study students and one full-time apiarist, the hives rarely provide a retail surplus of honey. "But," Rothenbuhler explains, "enough honey is always produced during the quarter for each student to take home an eight-ounce jar of honey from his or her very own hive."□

A Unique English Event

By KARL SHOWLER
Bucks, England

July 4, was possibly the first time in England that an Extension Officer has taught a one day school solely devoted to the construction of skeps (the straw baskets used by old time beekeepers instead of hives). The interest George Hawthorne, County Beekeeping Officer for the Royal County of Berkshire aroused has led to the establishment of a skep making group. They plan to complete the skeps they started at the school at a skep making circle. A skep bee? The school was held at the home of Mr. and Mrs. Ayling, Mapledurham near Reading where eighteen enthusiastic beekeepers gathered to learn from George the art and mystery of skep making.

Attending the school was Mrs. Janet Twigger, Coventry, editor of the News Letter of the British Corn Dolly Makers Association, whose own craft

(Continued on pg. 98)

Karl Showler demonstrates skep making.

ITALIAN PACKAGE BEES AND QUEENS

Quantity	2-lb. w/queen	3-lb. w/queen	4-lb. w/queen	Queens
1-5	$21.75	$26.75	$31.75	$7.65
6-25	20.75	25.75	30.75	7.00
26-99	20.00	25.00	30.00	6.45
100-499	19.25	24.25	29.25	6.00
500-up	18.75	23.75	28.75	

Marking queens — 50¢ Clipping queens — 25¢

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1 — 2-lb. $4.60	1 — 3-lb. $4.50	1 — 4-lb. $6.95
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Add shipping prices to packages if ordering by mail. Shipping charges include postage, insurance, special handling fees, and handling charges. Insurance coverage is for full value of bees only. Insurance does NOT cover shipping charges.

A $5.00 per package deposit is required to book orders; balance due 2 weeks prior to shipping. Personal check, money order or cashier's check accepted in U.S. currency only. Credit cards not accepted. Queenless packages available. Queens are Postpaid and shipped Air Mail.

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Queens clipped 25¢ each Queens marked 25¢ each

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A Unique English Event

(Continued from pg. 94)

is so closely allied to skep making. In the last 15 years, Corn Dollies, those small animals and toys made from plaited and penwork wheat straw, have enjoyed a great revival in England with groups and classes meeting in many areas. The skep maker has a great advantage today because of the Corn Dolly revival, suitable straws for skep making are now grown by specialist nurserymen and farmers.

Before the school commenced one or two of the class slipped away to see the nursery of Mr. Godfrey. On his grain lands at Goring Heath, he is growing on individual rectangular plots a number of long straw varieties selected from Britain and the USA. Cutting and harvesting these straws require special attention using either a scythe or reaper. The sheaves must also be handled with care so as not to damage the seed head or the straw. Seed heads are needed for Dollies but not for skeps.

George Hawthorne explained that to secure one layer of the straw rope to another to form the skep, a split cane binding is sewn between the coils. "Glossy lapping cane" is preferred to "plain lapping cane" for this binding, as the latter is not so durable. One member of the class was using chair seating cane but this is too fine and only suitable for miniature skeps or "pots". Pots are still used in Europe for queen raising and are the progenitors of the mininuc.

The members of the class obtained their binding from different sources such as local craft shops, workshops for the blind or basket makers. We were told heavy plastic baler twine could also be used, fiber twine although usable, is not acceptable by bees and even if the loose ends are flamed off bees get caught in the stubble until it is propolised down. A beautiful, if heavy skep, was on display made from plastic twine, twine being substituted for the straw too.

Regulation of the straw rope requires a "feeder" or gauge to keep the rope to size, about 1½" diameter, dependent on the final size of the skeps. Small skep, small horn; big skep, big horn. This can be made of tin, leather, wood, plastic (a section from the neck of a plastic bottle) or the traditional cows horn. The school was lucky, as a box of cow horns had been obtained from a local slaughter-house, so a number started "feeder" making, using a vice, hacksaw and rasps to cut and smoothe the horn.

To pass the binding through the straw rope a "skep needle" is required; a range of needles were demonstrated both home-made and adapted from sack sewing needles. The purist will use a section of turkey leg bone but others had cut up brass carpet rods or metal tube. Dutch Needles were also available, a small supply having been obtained from the Dutch BKA Supply House, The VBBV, Bijenhuis, Wageningen, The Netherlands who can also supply cane binding and skep "working" tools.

After a formal lecture, which was opened by George Knights, as secretary of the Royal Berkshire BKA; he had laid aside his British Beekepers Association President's chain of office, the group settled down to uninterrupted practice of what they had been shown.

Also attending the school was Mr. Beowulf Cooper (Derbyshire) Director of the British Isles Bee Breeders' Association, who is collecting material on the contemporary use of skeps in the British Isles and Europe.

A range of skeps and skep appliances were on display including material from the collection of International Bee Research Association.

The meeting drew to an informal close with thanks to Mr. Hawthorne, and Mr. and Mrs. Ayling for the use of their lawn and workshop and to those who had supplied the material used. □

Bees and the Law, by Murray Loring. Hamilton, Illinois: Dadant & Sons, 1981, 128 pages.

I took this book along with me for vacation reading, and immediately became engrossed. The author is a veterinarian, an attorney and a beekeeper, and clearly knowledgable in all three fields.

Honeybees, we learn, belong to that part of the animal kingdom known to the law as *ferae natura* — roughly, wild animals, as distinct from domesticated ones. As such, they are the property of no one, until hived. The bees in a bee tree belong to no one, though the tree belongs to the landowner where it stands. A swarm that escapes from a hive belongs to the owner of the hive only so long as he pursues it.

The keeping of bees is not, as such, a nuisance, under the law, and a beekeeper is not liable for stings or damage to other people unless negligence can be shown. This point is very important to beekeepers who fear lawsuits from persons who get stung. The occurrence of injury, by itself, is no proof of negligence. Thus, so long as a beekeeper tends his bees in a reasonable and prudent manner, and not in violation of any laws, he need not fear lawsuits.

Bees, it is a bit surprising to learn, can be trespassers. Here the principle is that a landowner has the right to use his land in a normal way, for his enjoyment and profit, and may, for example, use pesticides on it, and if bees become poisoned by entering his land then he is not liable. If, on the other hand, he uses pesticides in such a way as to endanger hives or other property nearby, then he is in trouble.

The income tax laws, as they apply to hobby beekeeping, are a bit odd. If you happen to make a profit from your hobby, then you must declare the income and pay the tax liability by declaring the loss. Of course if you keep bees commercially, even on a minute scale, then you can claim losses, as well as profits. The distinction between commercial and hobby beekeeper is not one of size, but of purpose. If your purpose is to make money, then you are a commercial beekeeper, for tax purposes, even if you own only a few hives.

It is a fascinating book, as well as a useful one for beekeepers who find themselves up against town boards who want to zone them out of business, or irate and litigious neighbors whose kids get stung, or tax collectors.

Richard Taylor

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25-99	$6.20	$18.75	$24.50	$30.50	$34.75
100 & up	$5.90	$18.00	$23.50	$29.25	$33.50

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News and Events

NEW JERSEY

Susan Post of Essex Fells, New Jersey was crowned New Jersey Honey Queen, 1983 by the New Jersey Beekeepers Association at the Beekeepers 80th Anniversary meeting in Bordontown, New Jersey in October. Susan became eligible to compete in the state contest after being selected by the Morris county Beekeepers last August to represent that chapter in the state contest. She was sponsored by her father, a bee hobbyist operating apiaries in Essex Fells and Frelinghausen.

Susan graduated from Montclair Kimberly Adademy, Montclair, New Jersey in 1981 and is now a freshman at Colgate University, Hamilton, New York. During 1983 she will continue her studies at Colgate in addition to representing the New Jersey Beekeepers, traveling on vacations and weekends encouraging the sale of honey, passing along technical and common interest facts on bees and generally promoting the beekeeping industry.

Susan Post

MAINE

The Maine State Beekeepers Assoc.

Association president Dave Ellis has announced that the Association's annual meeting will be held Saturday, March 26th at New Meadows Inn in West Bath, Maine. Program arrangements are being made by Roland Smith.

Host Committee Chairman Matt Scott has announced that Dr. Larry Connor of the Beekeeping Educational Service in Connecticut will offer a short course on beekeeping in August 8-10 prior to the 1983 conference of the Eastern Apicultural Society at the University of Maine at Orono, August 10-13.

TEXAS

Paris Junior College

An 18-hour basic beekeeping course will be offered by Paris Junior College's continuing education division beginning Tuesday, February 8th according to June Jones, Director of community Services at PJC. Classes will be held from 6:30 to 9:30 pm. Tuesdays and Thursdays for three weeks in the Alford Center.

Fee for the 18 hours of instruction is $35.00, to be paid in advance by mailing a check payable to Paris Junior College to the Continuing Education office or going by the office in the Alford Center on campus.

Instructor will be A.G. Bolton. he has taught in the past for Paris Junior College and for the Gordon Cooper Area Vocational Technical School in Shawee, Oklahoma.

The course will be valuable for persons interested in establishing a beekeeping business and selling honey and or pollen, the instructor said. More information may be obtained by calling the PJC continuing education office, (214) 785-7661, extension445.

CONNECTICUT

Connecticut Beekeeper Assoc.

The Connecticut Beekeeper Association will hold its Winter Meeting at the University of Connec-

(Continued on pg. 103)

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The Mraz strain has been developed and improved by Charles Mraz over the last forty years. It is noted for its fast spring buildup, low winter honey consumption and low off season brood production. Our further selection for disease resistance and ease of handling helps produce a strain which meets the demands of modern beekeeping.

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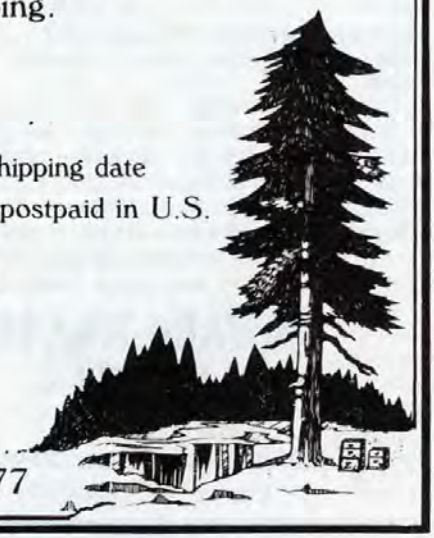

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Quantity	2 lb. w/queen	3 lb. w/queen	queens
1 — 9	$25.00	$29.00	$10.00
10 — 25	24.50	28.50	9.00
25 — up	24.00	28.00	8.00

Add for shipping packages via parcel post:

1-2	lb.	....	$4.60	2-2	lb.	....	$6.80	3-2	lb.	....	$7.90
1-3	lb.	....	$5.50	2-3	lb.	....	$7.70	3-3	lb.	....	$8.80

Add shipping prices to packages if ordering by mail. Shipping charges include postage, insurance, special handling fees, and handling charges. Insurance coverage is for full value of bee only. Insurance does NOT cover shipping charges. A $5.00 per package deposit is required to book orders: balance due 2 weeks prior to shipping. Personal checks, money order or cashier's check accepted in U.S currency only. Queens are postpaid and shipped air mail. Weather permitting shipments begin April 1st.

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1-10	$7.40	$7.90	$7.90
11-39	6.85	7.35	7.35
40-99	6.40	6.90	6.90
100-499	6.00	6.50	6.50
500-up	5.85	6.35	6.35

"DOUBLE HYBRIDS" same price as regular hybrids. For clipping and/or marking add 50c per queen.

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1-10	$23.45	$29.45	$23.95	$29.95
11-39	22.25	28.25	22.75	28.75
40-99	21.00	27.00	21.50	27.50
100-up	19.85	25.85	20.35	26.35

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3-lb. pkg. w/q	22.50	22.00	21.50
Queens	5.75	5.50	5.25

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Add $2.00 per 2-lb. package for postage, insurance, and special handling. Add 2.50 for 3-lb. package.

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25-100	$19.10	$24.20	$29.55	$35.15	$6.50
101-499	$18.55	$23.65	$29.00	$34.60	$6.25
500-up	$18.20	$23.25	$28.60	$34.25	$6.00

Clipping Queens 50¢ each — Marking 50¢ each
For queenless packages deduct $3.00 from above prices
Get worker bees only, don't pay for up to 20% drones you usually get in your package bees.

Packages can be shipped only by parcel post or your transportation. Get away for a few days, pool your order with your neighbor, pick your bees up here and save the postage. Deduct $.75 each if you bring your own usable cages. $3.00 deposit per package required to book your order — balance due 15 days prior to shipping date. For most desirable shipping dates book your order early.

We feed Fumidil-B for healthier stronger more vigorous queens and bees.

Prices subject to change without notice.
Thank you!

Shipping dates April 1st thru May 20th

JACKSON APIARIES
P.O. Box 159
FUNSTON, GEORGIA 31753
Ph. 912-941-5522 — night 912-941-5215

News and Events

(Continued from pg. 100)

ticut Waterbury Campus on February twenty-sixth, Nineteen Eighty Three.

The Winter Meeting will be highlighted by talks on 'Pollen Collecting and Marketing", "Two-Queen Colony Management" and "A Report of a Survey on Pesticide Poisoning of Connecticut Honeybees" as well as a series of workshops on: How to Hive A package of Bees; Bee Diseases; How to Produce Comb Honey; and an Evaluation of Pollen Traps. For additinal information contact F. Hartman, Simbury, CT 06484.

FLORIDA

Carol Marie Tschida was selected as 1983 Florida Honey queen at the Florida State Beekeepers Convention in Panama City Beach on November 4-5-6, 1982. Carol is the daughter of Gabe and Carlene Tschida of Lake Wales, Florida. She has already started a very busy schedule attending fairs, exhibitions and parades in Miami, Umatilla, her hometown of Lake Wales, Alachua and High Springs. Carol is attending Webber College and plans of majoring in public relations in the field of travel and tourism. Carol is a beekeeper and has 25 hives of her own.

Carol Marie Tschida

DELAWARE

Bee Program

A program of Intermediate beekeepers is set for March 12th and 13th at the University of Delaware in Newark, Deleware.

The registration fee for the two day program will be $35.00 per person ($40.00 at the door). A second person from a family or business may enroll for a reduced rate of $25.00. The fee will include speakers, facilities, coffee breaks, and handout materials.

Pre-registration is strongly advised, since space is limited. Mail your check or money order to Beekeeping Education Service, P.O. Box 817, Cheshire, CT 06410. Phone 203-271-0155 for further information. Include your name, address, and phone number with payment.

ALBERTA, CANADA

Alberta Beekeepers' Association

The Alberta Beekeepers' Association, at its 49th Annual convention in Edmonton, chose Mr. Gerard Hachey of Falher, Alberta as the recipient of its 1982 Achievement Award in recognition of outstanding contribution to the beekeeping industry of this province.

Mr. Hachey has served the Association in many capacities since first becoming a member in 1971, always with enthusiasm, concern, and a sense of the future.

WASHINGTON

W.A.S. Convention

The Western Apicultural Society 1983 will be held on the campus of the University of Washington in Seattle during the week starting August 22. As at the former WAS conventions, on campus housing will be available and most of the meals will be eaten in campus facilities. The University is one of the largest single campus universities in the U.S. and has during the academic year a student population of over 30,000. It has a pretty campus which has a waterfront along the South side and the East side. The University waterfront is, however, just a tiny portion of Seattle's lake and Puget Sound waterfront, much of which is visible by boulevards on each side the twenty-seven mile long Lake Washington which borders Seattle on the East.

If you have any doubts that Seattle is a beautiful place for a convention and a fun place for the whole family, talk to any of the more than seven hundred who attended the Seattle American Beekeeping Federation Convention in 1981.

If you are not a member of the WAS or EAS on which WAS is modeled and you wish further information, write Mrs. Zandy Neese, secretary, 11104 58 Street., Miraloma, CA 91752.

(Continued on pg. 106)

1982 Achievement Award recipient Gerry Hachey of Fahler Alberta, Canada with Prof. Gong I-Fei of China at 49th Annual Convention.

YORK'S... Quality Bred

1 STARLINES
9 MIDNITES
8 ITALIANS
3

The Strains Preferred by Leading Honey Producers

Have you tried York's bees and service? Make 1983 your season to purchase your bees from a firm featuring both types of hybrid stock. New Starlines and Midnites continue to be the only privately developed strains of hybrids that consistently return more honey per colony. Be modern and use hybrid queens that produce vigorous workers which will extend your season and add to your total crop. Shipment made by parcel post, or truck or station wagon. Information leaflets available on Starlines and Midnites; write us for your copy by return mail. Now booking for choice dates.

Bees & Queens

For Hobbyist — Honey Producer — Pollinator

ITALIANS

		1-3	4-25	26-99	100-up
2-lb. pkg.	w/q	$20.50	$19.75	$19.00	$18.50
3-lb. pkg.	w/q	26.00	24.90	24.25	23.75
5-lb.pkg.	w/q	38.90	38.00	37.00	36.00
Queens		6.50	6.00	5.50	5.00

STARLINE OR MIDNITE

		1-3	4-25	26-99	100-up
2-lb. pkg.	w/q	$21.00	$20.25	$19.50	$19.00
3-lb pkg.	w/q	26.50	25.50	24.75	24.25
5-lb. pkg.	w/q	39.40	38.50	37.50	36.50
Queens		7.00	6.50	6.00	5.50

Prices F.O.B. Jesup

Queenless packages — deduct $3.00 per pkg.

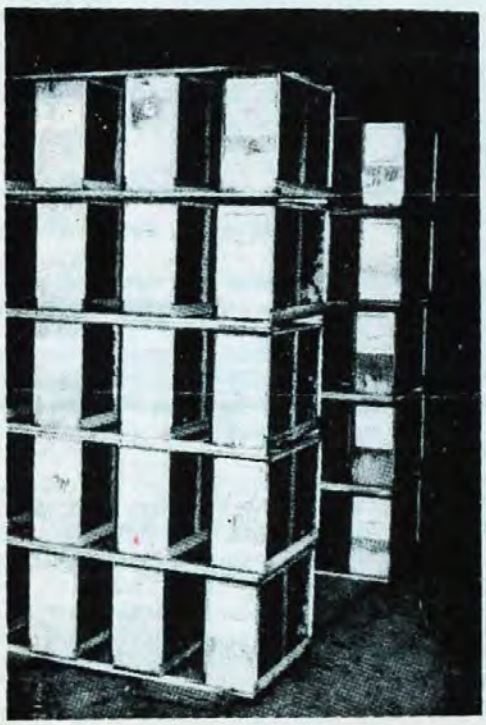
Tested Queens — add $1.50 per pkg. or queen.

Clipped and Marked 50¢ each.

Terms: Small orders cash, larger orders $2.00 deposit per package and ballance three weeks prior to shipping date. Allow three weeks for personal checks to clear.

WRITE FOR FREE COPY OF SHIPPING RATES AND INFORMATION

Shipments start first of April depending upon spring weather conditions.



APRIL 1983

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26	27	28	29	30		

MAY 1983

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31						

JUNE 1983

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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

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PLAN NOW on your shipping dates for the coming spring. Present indications are that shipments will have to be planned now for more difficult delivery schedules by parcel post. Now booking orders.

Particularly plan to use hybrids for the coming season. Our rate of production of hybrids continues to rise as modern, commercial beekeepers learn of increased benefits to them. BEE WISE — HYBRIDIZE.

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News and Events

(Continued from pg. 103)

PENNSYLVANIA

Beaver Valley Area Beekeepers Association

A course on Beginning Beekeeping will be held February 12th, 1983, Saturday from 9am. to 3:30pm. at the Penn State Beaver Campus, General Classroom Bldg. #1 Room 115-A, Rt. 18, Monaca, PA. Registration is due by February 4, 1983. Check must accompany registration, payable to Beaver Valley Beekeepers Association. $15.00 per person, $18.00 per couple, $3.00 each additional member. Mail to Dale F. Capps, Sec. Treas., RD #1, Box 135, Darlington, PA 16115.

NEW YORK

1983 Workshops

Bob Stevens of Betterbee, Inc., and Larry Connor of Beekeeping Education Service, will sponsor four workshops this spring at Betterbee in Greenwich. Each program is separate, but they are scheduled on two weekends to minimize travel, and to save participants money!

Registration fees are payable to Dr. Larry Connor, BES, P.O. Box 817, Cheshire, CT 06410 (Phone 203-271-0155), and should be mailed five days prior to the program(s). Space is limited. Late registration, at the door, is $5.00 a day additional.

No. of Programs (Days)	One Person	Second Person*
1	$15	$10
2	25	17
3	34	23
4	42	28

*Member of family or business partner.

Intermediate Beekeeping
Saturday, April 30, 1983

Advanced Beekeeping
Sunday, May 1, 1983

Queen Rearing and Use
Saturday, June 18, 1983

Increasing Colony/Apiary Productivity
Sunday, June 19, 1983

OKLAHOMA

Oklahoma Beekeepers Assoc.

In 1982 the officers of the Oklahoma Beekeepers Assoc. decided to begin a tradition by choosing a "Beekeeper of the Year" for Oklahoma and present this beekeeper an award plaque. It was decided to name the award after the first recipient.

Then came the difficult choice of recipients. Oklahoma can boast many fine and hard working beekeepers. Among them have been those who worked, not only with their own bees, but for the good of other beekeepers, for education of the public in beekeeping and for promotion of beekeeping in general. After much debating back and forth, the officers came up with the name of one man on whom the majority could agree. That name was Albert Lincoln.

L. to R. Jim Grayson, Vice President, Oklahoma Beekeepers Assoc.; Albert Lincoln, Oklahoma Beekeeper of the Year; M.L. Lashbrook, Pres., Oklahoma Beekeepers' Association.
Photo by Jack Tucker

NEW HAMPSHIRE

Bee Association

Our State Association holds two meetings a year in April and Oc tober. There are six subordinates: Merrimack Valley, that meets the first Saturday evening of the month in the Hudson Town Hall; Connecticut Valley that meets one month in Keene New Hampshire, the next is Brattleboro VT; The Sea Coast Beekeepers meet in Rochester or Durham. This spring, starting March 9, for two hours each week for 8 weeks at the Berrett House in Durham. They will be conducting a bee school. The Pawtuckaway Beekeepers meet once a month at the Candia Library. The Upper Valley Beekeepers meet each month in Hanover. The Northern New Hampshire Beekeepers in Conway and the newest groups meet in Warner.

Each spring for nine years we have trucked up to 500 three pound packages of bees from Georgia, some for new beekeepers, some to increase what they now have. At our Fall meeting for two years, we have held a honey and wax show.

Some of our members hold a license to operate the Fumigator which is set up in different places around the state. This has proven to be a big help in the fight to keep bee diseases down. This year we added another chore, the buying of honey bottles by the truck load for a reduced price to our members.

NEW YORK

Beekeeping Basics Course

A special, four day educational opportunity will be available through the Dutchas County (New York) Cooperative Extension Service and Beekeeping Education Service, on weekend days in February, March, and April of 1983.

Sessions will run from 9:30 am. to 4:00 pm. of February 19th, March 5th, March 19th, and April 24th, 1983 at the Cooperative Extension Center in Millbrook, New York, outside of Poughkeepsie. Beekeepers from New York, Massachusetts, and Connecticut are invited to participate.

Course instructor is Dr. Larry Connor, Director of Beekeeping Education Service, with assistance of Rod Bates of Poughkeepsie. On April 24th,

Dr. Dewey Caron, Chairman, Dept. of Entomology and Applied Ecology, will be special guest instructor.

Sessions may be enrolled as a package at significant savings, or by individual sessions. The total course fee is $65.00 per person. Individual sessions may be attended for a fee of $20.00. The fee covers the cost of the instructors, and Beekeeping Basics, a home-study program valued at $30.00, plus the text — *"The Beekeeper's Handbook"* valued at $9.95, and refreshments. Participants should bring a brown-bag lunch. Coffee will be available. Those attending only part of the sessions will receive pro-rated information.

Registration information and payment should be sent, in advance, to Beekeeping Education Service, P.O. Box 817 Cheshire, CT 06410, Phone 203-271-0155 for further information.

What follows is a summary of each of the sessions:

Saturday, February 19, 1983

Beekeeping Equipment and Getting Started with Bees, Honey Bee Colony Structure, Establishing Colonies, especially packages.

Saturday, March 5, 1983

Establishing Colonies, especialy nucs, divides and increase colonies, Winter and Spring Management, and Honey Bee Diseases and Pests. And related subjects.

Saturday, March 19, 1983

Honey Production and Pollination Services, Bees and Flowers, and Bee Pests and Pesticides. And related subjects.

Sunday, April 24, 1983 (Dr. Caron, Guest Instructor)

Queens: Use and Management, Queens: How they Work, Queens: Small Scale Rearing and Section Honey Production. Honey/Product Marketing.

INDIANA

Indiana State Beekeepers Assoc.

The Indiana State Beekeepers Association will hold its' annual workshop meeting on March 12, 1983 at the Indiana State Museum, 202 North Alabama Street, Indianapolis, IN 46204. Registration will begin at 9:00 am. ($5.00 single, $6.00 family) and the meeting will convene at 9:30 am. All registrants will receive a copy of *"How To Keep Bees And Sell Honey"* by Walter T. Kelly. One of the featured speakers of the day will be Howard Veatch of Dadant & Sons, Inc. Any questions concerning the meeting can be directed to Caude Wade, State Entomologist, 613 State Office Bldg., Indianapolis, IN 46204, Ph: 317-232-4120.

DELAWARE

Delaware Beekeepers Assoc.

Dr. Bob Berthold, Assistant Chairman of Biology and Beekeeping Specialist of Delaware Valley College, Doylestown, PA, will be one of the featured speakers at the Annual Meeting of the Delaware Beekeepers Association.

The meeting will be held on Saturday, March 26th, 1983 at the Continuing Education Building of the Delaware State College. The College is located in the State of Delaware just North of Dover on U.S. Highway 13, the program starting at 8:30 am.. Drs. Chuck Mason and Dewey Caron of the University of Delaware Department of Entomology will be presenting a workshop on queen-rearing and requeening. The nominal fee of $3.00 will be charged for this workshop. Following the workshop will be coffee and doughnuts and then the State Apiarist Mr. Mike Brown's report. This will be followed by Dr. Bethold's wax workshop. In the afternoon, in addition to Dr. Berthold's talk, Dr. Caron will discuss honey marketing in Delaware.

The Delaware Beekeepers welcome anyone who is interested in their program. Anyone interested in additional information should contact Mr. Bob Macintire, Ph: (302) 945-0829.

Dr. Bob Berthold

The Key to Happy Beekeeping

(Continued from pg. 90)

holes near the wrist area and long sleeves (or gauntlets) attached.

Those gloves were one of the best buys I ever made. I requeened a hive (that same nasty swarm) later in the week and didn't get one sting on my hands, wrists or arms. I did get a few on the rest of my body, but the areas that usually got the worst punishment were reprieved.

So I started thinking about my equipment; my veil was home made and I had used flimsy nylon net that frequently got snagged and was "much mended" My suit was a pair of lightweight coveralls given to me by a friend, which I had bleached, and made over into a bee suit.

I got out the bee catalogs from my filing case and started reading them, not just glancing through and looking at the prices, but seeing what each company had to say about their products. I ordered a new hat and veil and bee suit, and with two of my own additions (elastic cuffs on the pant legs and a ring on the lower back of the veil) I have become almost bee proof. I almost never get stung and can work any hive at all, no matter how srong or how nasty, without fear. I still get stung occasionally, but beekeeping is a joy again.□

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Classified rates. 45¢ per counted word, each insertion, payable in cash in advance. Each initial, each word in names and address, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it) count as one word. Not less than 10 words accepted. Copy should be in by the 5th of the month, preceding publication. Send classified ads to : The A. I. Root Co., Advertising Department, Gleanings in Bee Culture, 623 W. Liberty St., P.O. Box 706, Medina, Ohio 44258-0706

MAGAZINES

THE AMERICAN BEEKEEPING FEDERATION needs your support; participate in national affairs; receive six issues of the NEWS LETTER per year. The ABF, Inc., 13637 N.W. 39th Avenue, Gainesville, FL 32601. TF

THE SCOTTISH BEEKEEPER — Magazine of The Scottish Beekeepers' Association, International in appeal. Scottish in character. Membership terms from A. J. Davidson, 19 Drumblair Crescent, Inverness, Scotland. Sample copy sent, price 20 pence or equivalent. TF

THE INTERNATIONAL BEE RESEARCH ASSOCIATION regularly publishes new information on bees, beekeeping, and hive products, for beekeepers and scientists all over the world. Mail inquiries from USA: H. Kolb, P.O. Box 183,, 737 West Main, Edmond, OK 73034, Phone: (405) 314-0984. IBRA Publishes: **Bee World,** a quarterly journal for the progressive beekeeper. **Apicultural Abstracts,** a survey of scientific literature from all languages. **Journal of Apiculture Research,** for original bee research papers. Books and pamphlets on all beekeeping topics. Catalogues of publications and details of journals and membership $1. Specimen copy of **Bee World** $1.50; **Journal of Apicultural Research** $1.50; **Apicultural Abstracts** $2.00, from INTERNATIONAL BEE RESEARCH ASSOCIATION, Hill House, Gerrards Cross, Bucks. SL9 ONR, England. TF

DAIRY GOATS—for milk, pleasure and profit. Excellent for children, women and family! Monthly magazine $11.00 per year ($13.50 outside U.S.A.). DAIRY GOAT JOURNAL, Box 1808 T-3, Scottsdale, Arizona 85252. TF

BEEKEEPING. A West Country Journal—written by beekeepers—for beekeepers. 1.50p inland or 1.80p ($4.00 Overseas). 10 issues yearly. Editor, R. H. Brown, 20 Parkhurst Rd., Torquay, Devon, U.K. Advertising Secretary, C. J. T. Willoughby, Henderbarrow House, Halwill, Beaworthy, Devon, U.K. TF

SCOTTISH BEE JOURNAL. Packed with practical beekeeping. Sample copy from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. Published Monthly, $4.00 per annum. TF

BEE CRAFT — Official (monthly) magazine of the British Beekeepers Association. Contains interesting and informative articles. Annual Subscription (Sterling cheque 2.22 p.or U.S. $6.) Post paid. The Secretary, 15 West Way, Copthorne Bank, Crawley, Sussex, RH10 3DS. TF

INDIAN BEE JOURNAL Official organ of the All India Beekeepers' Association, 817, Sadashiv Peth, Poona 411030. The only bee journal of India Published in English, issued quarterly. Furnishes information on Indian bees and articles of interest to beekeepers and bee scientists.

Annual subscription postpaid in foreign countries: For individuals US $7.00 for institutions, companies and corporate bodies US $10.00 or it's equivilent, to be received in advance by IMO or bank draft, payable in Poona (India). TF

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BEEKEEPING BASICS Home Study Course — Eight Lessons Provide Interaction with Larry Connor — $39 Complete. Box 817, Cheshire, CT 06410, 203-271-0155 TF

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Dealership Territories available in some areas. Please contact The A. I. Root Co., P.O. Box 706, Medina, OH 44258 TF

Potent male virility hormone! Details — $1.00. Genie, ox 4090 A.I.R., Youma, Arizona 85364 1/83

BEE JOKES (100 Real Honeys). Send $2.00 To: BEE JOKES, Box 88, Granville, OH 43023 3/83

HONEY WANTED

BEEKEEPERS TAKE NOTICE — We cannot guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for CASH only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

All Grades of Honey, Any quantity drums or cans. Call Toll Free 800-248-0334. Hubbard Apiaries, Inc., Box 160, Onsted, Michigan 49265. TF

WANTED—All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, OH. TF

WANTED — HONEY, all grades, Send samples and price. M. R. Cary Corp., Box 122, Syracuse, N. Y. 13208. TF

BUCKWHEAT, light and light amber honey. Bedford Food Products, Inc., 209 Hewes St., Brooklyn, N. Y. TF

WANTED: comb and all grades of extracted in 60's or drums. Send sample and price to MOORLAND APIARIES INC., 5 Airport Drive, Hopedale, MA 01747. TF

WANTED—All grades of extracted honey. Send sample and price to MacDonald Honey Co., Sauquoit, New York 13456. Area Code 315-737-5662. TF

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. Hubbard Apiaries, Onsted, Mich. TF

CLOVER, ALFLALFA, Buckwheat, Tulip Poplar, Wild Flower, or Orange in 60's. Dutch Gold Honey, Inc., 2220 Dutch Gold Dr., Lancaster, PA TF

HONEY IN 60's FOR SALE. Bedford Food Products Co., 209 Hewes St., Brooklyn, New York 11211. Telephone: 212-EV4-5165. TF

CLOVER, ORANGE, U.S. and Yucatan Wildflower, in sixties. Other flavors and bakery grade available. MOORLAND APIARIES, 5 Airport Dr., Hopedale, MA 01747. TF

BOOKS

RICHARD TAYLOR'S FORTY YEARS BEEKEEPING EXPERIENCE IN HOW-TO-DO-IT BOOK OF BEEKEEPING. $6.95 ppd. LINDEN BOOKS, INTERLAKEN, NY 14847. TF

"BEEKEEPING BASICS", Larry Connor's interactive home study program, $38. Eight Color Beekeeping Postcards, $5. Box 817, Cheshire, Connecticut, 06410-0817. TF

MANAGE BEES BETTER. Read **Beekeeping Tips and Topics** and **Beekeeping in the Midwest** by Elbert R. Jaycox. Either paperback, $7.95 plus $1.00 postage, handling. Bee Specialist, Dept-R2, 5775 Jornada Road, Las Cruces NM 88001 4/83

PROPOLIS THE ETERNAL NATURAL HEALER $5.95 soft, $8.50 hard, plus $1.50 shipping. For table of contents, discounts etc. send stamped envelope.

Pollen books: *Pollen The Miracle Food, Source of Youth, Vitality and Longevity,* $40.00 — 100 books postpaid. (For smaller quanitites write to: Nutri-Books Corp., Denver, Colo. 80217). Murat Company, 2132 Northwest Eleventh Avenue, Miami, Florida 33127. Phone 305-325-9990. 10/83

CLASSIC REPRINTS: Miller's *Fifty Years Among The Bees,* $7.95 softcover, $12.50 hard, $1.00 shipping. Root's 1890 *ABC of Bee Culture,* $11.50 softcover, $17.95 hard, $1.25 shipping. NY residents add 6% tax. Molly Yes Press, RD 3, New Berlin, NY 13411. TF

WANTED

WANTED—All varieties bee gathered pollen. Must be clean and dry. Pollen traps available. Hubbard Apiaries, Onsted, Mich. 49265. Phone: 517-467-2151. TF

WANTED — Old Beekeeping Books and Bee Journals. James Johnson, 107 State Ave., Terra Alta, W.V. 26764. TF

Power Capping Knife or similar type capper and Brand Jr. type melter. Wayman Wilson, 3426 Harrison Pike, Chatt, Tn 37416. 2/83

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FRESH, PURE, Bee Pollen available in 1 pound containers at $8.50 per pound postpaid. 10 pound bulk pack at $7.90 per pound. Large lots, ask for price. Hubbard Apiaries, Inc., Onsted, Mich. 49265. TF

POLLEN FOR BEE FEED. Postpaid, Insured, Duty free. 1-24 lbs. $3.75/lb., 25-100 lbs. $3.50/lb. Discount for over 100 lbs. 5 lbs. minimum order. Silver Star Apiaries, P.O. Box 186G, Vernon, BC V1T 6M2 3/83

BEE HEALTHY & ENJOY Canada's best bee pollen. From the pure north of British Columbia. Excellent flavor, superior quality, and guaranteed pesticide free. 3 lbs.-$22.00; 6 lbs.-$39.00; 10 lbs.-$54.00; 20 lbs.-$100.00, ppd. Blossomtime, P.O. Box 1015, Tempe, AZ 85251 TF

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POSITION WANTED

Enthusiatic hobbyiest is seeking employment and career in honey production business, married. Please contact Gary Rider, Box 12, Morrisonville, WI 53571, Ph: 608-846-4622 2/83

SEEDS

Mixed sweet clover seed, 50% white, 50% yellow. 10 lbs. $7.50 plus U.P.S. Innoculant $1.50. Higgins 3801 US 50, Hillsboro, OH 513-364-23313/83

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WE USE ALL POSSIBLE CARE in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

ONE HUNDRED full 10 frame colonies of bees $40.00 — $50.00. Heavy with honey. State inspected with 3 stainless storage tanks. Phone 904-245-2461. L.M. Hubbard, Belleview, FL 32620. TF

Nucs $25.00 — 3-frames/queen — Hybrid — guarantee live delivery — Shipped in cardboard container. F.O.B. Dixie Honey Company, E. A. Cannady, 919-579-6036. Rt. 3, Box 206A, Shallotte, NC 28459. TF

Colonies for sale in Florida. Call Evenings only, (904) 567-9495. No Collect Calls. Terms Negotiable. TF

500 colonies of bees on good Spring Buildup locations with or without supers. Also nuclei, package bees and queens. G.C. Walker, Jr., Rogers, Texas 76569, 817-983-2891. TF

PACKAGE BEES delivered to Wisconsin near Green Bay, Eau Claire and my home. Ronald Hazard, RT 2, Poynette, Wis 53955. Phone: 414-992-3217. 4/83

Fifty 1½ story colonies, 10 frame, $55, also 200 med. supers, no wax $5, in Ark. Write R. T. Ruh, 2834 Briarcliff Rd., Atlanta, GA 30329 or 404-636-1935. 2/83

Carniolan Bees & Queens, Queens $6.50@, 3 lb. pack with Queen $22.50@, 2 lb. pack with Queen $16.50@. Live delivery guaranteed. Health certificates furnished. Shipments begin April 10th. **King Bee Apiaries,** Rt. 4, Box 90, Greenville, AL 36037, Ph: 205-382-2305 2/83

100 8-fr. Two story colonies of bees in very good condition. J.O. Hallman, Blackshear Georgia 31516, Ph: 912-449-6350 2/83

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FOR TOP QUALITY BEE SUPPLIES and advice on beekeeping problems, visit your nearest Root dealer and send for your FREE Root catalog. Satisfaction guaranteed. The A.I. Root Co., P.O. Box 706, Medina, OH 44256. TF

Four frame nucs and singles available early in May in north-central Illinois. Tannes Orchard, Speer, Illinois 61479. Ph: 309-493-7781 or 309-493-5442 5/83

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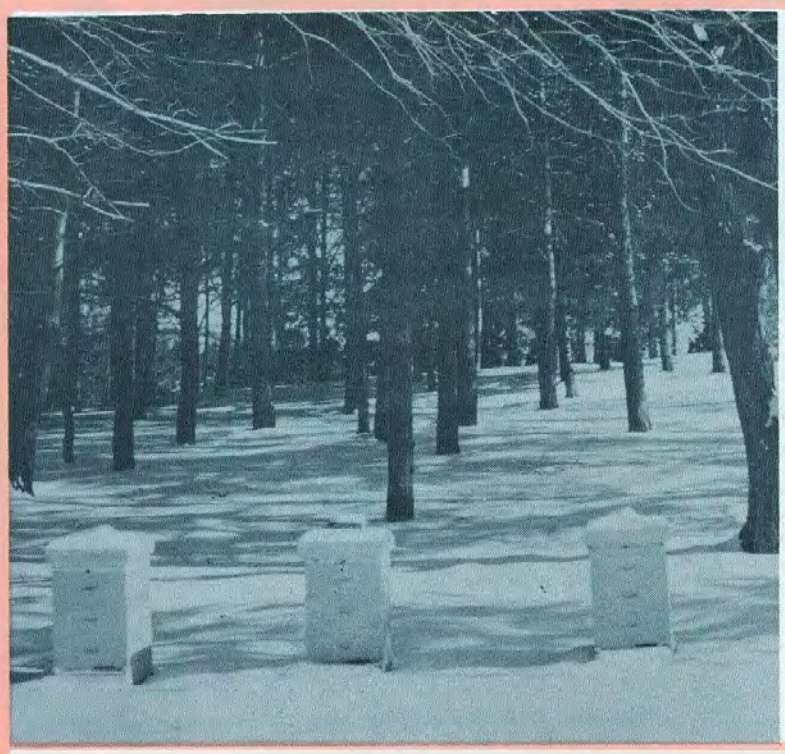

FEBRUARY CHECKLIST

AT THE APIARY . . . . . on a sunny day, warm enough for bees to fly:

- Check hive ventilation. Have you provided an upper entrance?
- Check drainage. Are hives tilted forward a bit? Remember, moisture means stress.
- Look for evidence of brood rearing (but don't disturb frames).
- Could this site use a windbreak?

BACK AT THE MAIN HOUSE . . . . . you're allowed a 15-minute breather, and then — gear up for spring

- Time to go over your equipment. What needs scraping, painting, replacing?
- Give your frame inventory a thorough inspection — sagging, broken comb, too many drone cells? Better lay in a supply of **ROOT'S** 3-Ply or Wire-Ply foundation today.
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