

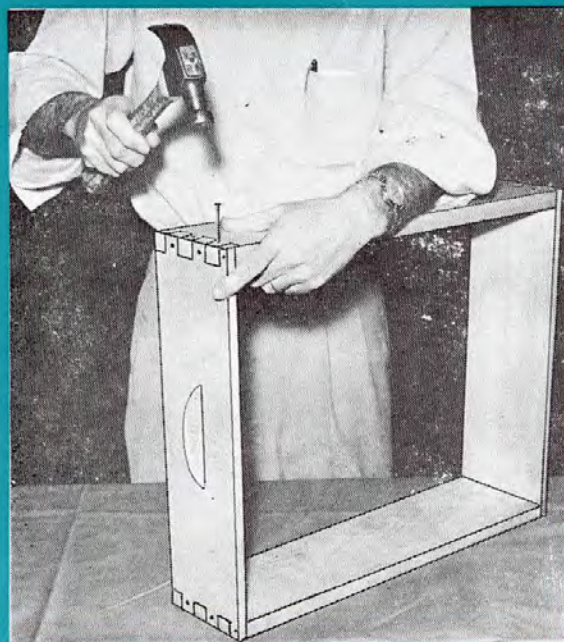
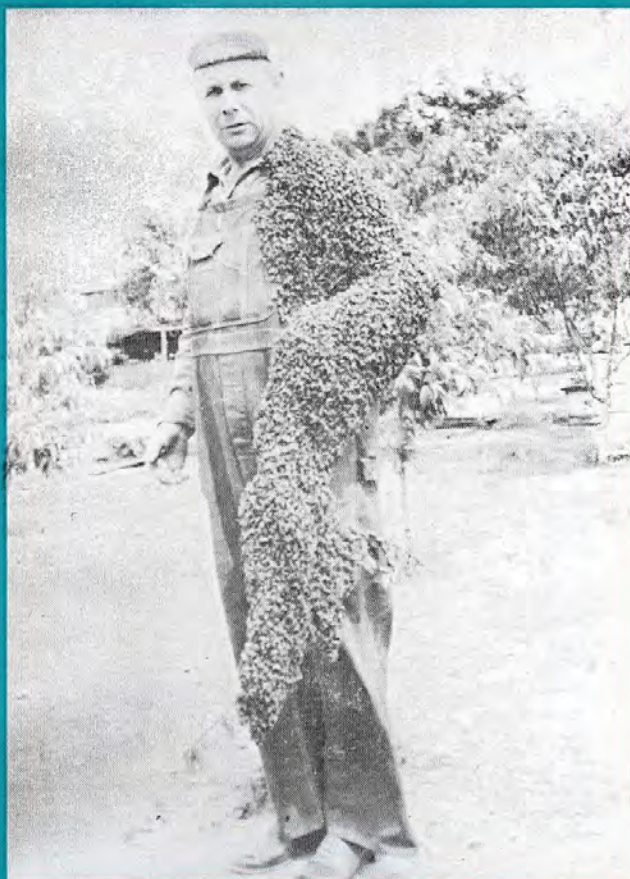
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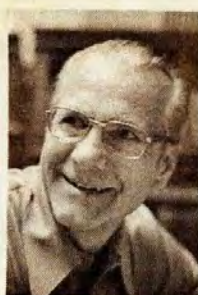
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COVER STORY

Optical instruments and laboratory analysis have revealed most of the anatomical details of the honeybee but many unanswered questions remain about the behavior of the bee. Some of the capabilities of the honeybee defy explanation, as revealed in the article "The Honeybee Knows All the Angles", in this issue.

Gleanings in Bee Culture

May 1979

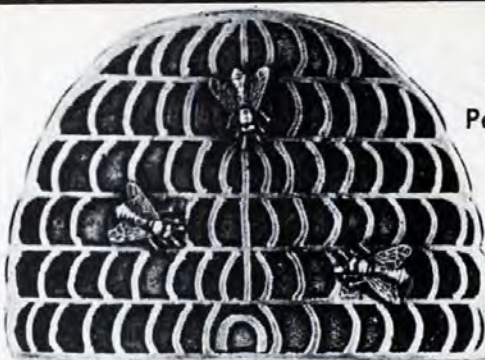
Vol. 107, No. 5

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CONTENTS

Monthly Honey Report	Lawrence Goltz	222
Gleanings Mail Box		226
The Queen Honeybee	Grant D. Morse, Ph.D.	229
The Andes Pollen Trap	Manuel Chepote Malatesta	230
American Honey Producers Convention ...	Lois Moore	232
Honey Plants	William G. Lord	234
The Transferring of Bees	Howard J. Rock	235
A Bear Story	Robert Peters	236
Bee Locations	Robert Horn	237
The Honeybee Knows All the Angles	George Ritter	238
Production of Quality Queens	J.E. Hastings	239
Siftings	Charles Mraz	242
Bee Talk	Dr. Richard Taylor	243
Ohio State Honey Queen		243
From the West	Charles J. Kooover	244
Research Review	Dr. Roger A. Morse	245
Book Review		245
Fundamentals for All	W. A. Stephen	246
Bountiful Snows		246
Notes From the Straw Skep	Bess Clarke	247
Questions and Answers		247
Bee Speed Law	Joan Le Mieux	248
Swarm Prevention	Dr. Roger A. Morse	249
My Butterfly Net Swarm "Clincher"	Roland Bell	250
An Innovative Approach to Extracting ..	H. Cunningham	251
Some Thoughts on Comb Building ...	Clifford Beckwith	253
Young Beekeeper Science Fair Winner		254
What Price Comb Honey?	Robert Snibbe	255
News and Events		256
New Bulletins and Instruction Media		259
Bees Increase Cantaloupe Production		262
Tampa Bay Chooses Honey Queen		262
Hot Dip Preserves Hives	George B. Hinton W.	262



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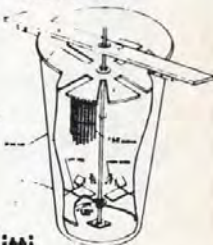
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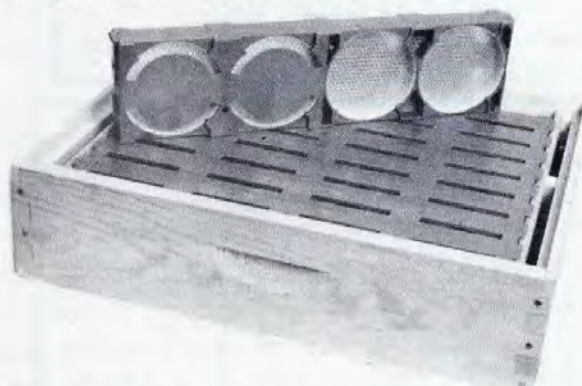
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Monthly HONEY Report

LAWRENCE GOLTZ

April 10, 1979

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								
	1	2	3	4	5	6	7	8	9
In 60 Lb. Cans									
White (per lb.)		.55	.54	.50	.55	.52	.50	.47	.48
Amber (per lb.)		.48	.53	.47	.50	.46	.49	.42	.46
1 lb. jar (case 24)			21.80	18.50	24.00	19.50		18.25	
2 lb. jar (case 12)			21.00	17.50		19.00		18.00	
Retail Extracted									
8 oz. jar	.65	.60	.60	.65	.65	.58		.65	.68
1 lb. jar	1.35	1.05	1.12	1.12	1.21	1.04	1.05	1.04	1.20
2 lb. jar		2.10	2.15	1.95	2.35	1.95	2.00	1.99	2.18
3 lb. jar		2.70	3.10		3.25	3.00		2.94	2.92
5 lb. jar	5.70	4.45	4.75	4.25		4.50		4.90	5.15
16 oz. Comb		1.65	1.75		1.45	1.30		1.50	1.64
16 oz. creamed		1.15	1.15	1.20	1.29				

Beeswax — Light \$1.70 — Dark \$1.60

Misc. Comments:

Vermont—Where bees had sufficient stores they have wintered well in spite of cold winter. Very little clover being grown in Champlain Valley.

Rhode Island—Not much winter kill. Bees in good condition.

New York—Bees came through winter in excellent condition, best in years. Wholesale price of honey moving upward. Honey sales very good at retail.

New Jersey—Winter loss low but feeding needed.

Pennsylvania—Bees in good to fair condition.

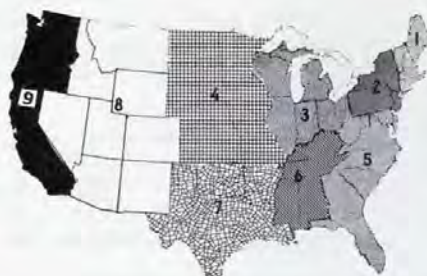
Ohio—Bees bringing in pollen in early April. Winter loss 5-10% or less. Honey selling well retail. Wholesale prices strong, but supplies limited.

Michigan—Bees needed feeding in early spring. Shortage of white honey at wholesale. May have considerable winter kill in some areas.

Illinois—Bees being fed in early spring. Southern half of state had better wintering condition than north. Bees in fair condition. Good moisture conditions.

Indiana—Bees using a lot of honey but nice looking clusters. Began carrying in pollen March 20th.

Wisconsin—Reports of high winter kill (50%) from northern Wisconsin. Hope for less than 8% loss in southern part of state.



Iowa—Moderate to heavy winter loss, much feeding needed throughout the spring. No honey available at wholesale. Local packers offering 54 cents.

Minnesota—Long winter confinement of bees ended March 15th. Winter loss fairly heavy in northern Minnesota, probably 30-35%. Some starvation, some loss due to long confinement. Ground moisture, conditions fair.

Nebraska—Winter loss variable, 10-15% and higher. Much rain. Honey sales good. Break in weather at end of March gave bees good flights. Bees in good condition, but feeding needed.

North Dakota—Bees in good condition.

West Virginia—Bees overwintered well and are in good condition.

Virginia—Bees are building up well. Some feeding necessary in spring. Honey sales good. Moisture conditions good. Bees building rapidly during April for honey flow.

North Carolina—Bees built up rapidly during spring. Winter loss very low, and most colonies had ample honey stores to carry them through the winter and spring build up. Ground moisture conditions good.

Alabama—Bees in good condition. Have ample moisture. Queen and package producers with adequate bees at beginning of April. Good early honey flows at end of March.

Kentucky—Above normal temperatures first three weeks of March allowed good amounts of pollen to be stored. Beekeepers have been able to do necessary spring feeding and colonies were found in unusually good condition. Honey sales normal.

Arkansas—Bees building up rapidly in late March and early April. Swarming may be a problem. Wholesale price of honey going up. Beekeepers buying queens and packages to replace winter losses or make increases. May be a good spring honey crop.

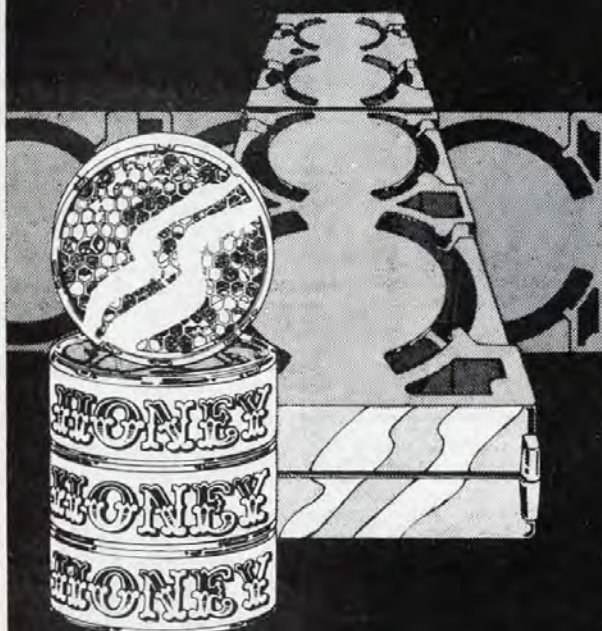
Oklahoma—Demand for queens and packages high. Bees in fair condition. Moisture conditions good.

Montana—Some overwintered yards lost up to 20-30% from winter kill due to long cold spell in early winter. Moisture situation for summer irrigation has improved. Bees in good condition.

Colorado—Late heavy snows and cold weather held back buildup of bees during March. Winter stores were low and

(Continued on page 260)

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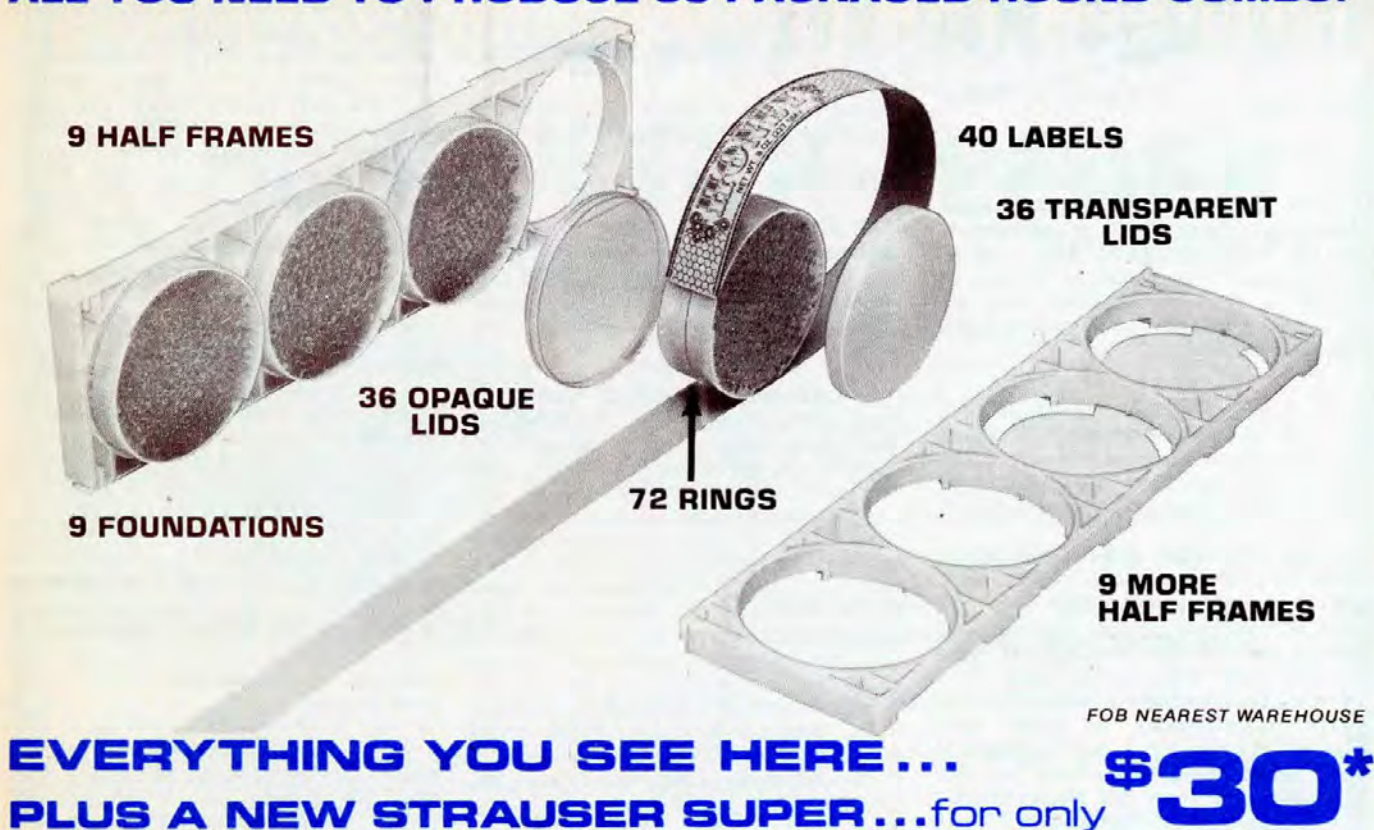
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Gleanings Mail Box

Dear Editor:

Tom Hooker, in his letter in the March issue of **Gleanings** suggests that the magazine become a sounding board for legislation "favorable" to beekeepers. Has he truly considered what "favorable" means? Are my needs the same as the fellow in North Dakota? Are the hobbyist's needs the same as the 5,000 colony operation?

Can he remember when the states cried for a bit of "Federal money" (whatever that is since citizens create real wealth, not government) and now they cry because the strings attached were too costly?.....

When Americans can't stand alone, proud to produce a quality product at a fair price without "Uncle's" help, we need to back out of our business and become social workers or such and make way for those who can produce. Civil remedies can be sought by individuals or private organizations to which they belong, where injustice occurs (pesticide kills, adulteration, etc.). Let's not ask Washington for help. We always get too much, and we can't afford the price tag! The "grease" on our wheels today is OSHA's excuse to close the plant for

slippery floors tomorrow!!—Alfred B. Coombe, Gurley, AL.

Dear Editor:

In your response to honey production without the use of queen excluders, (page 80, Jan. 1979), you have provided a very negatively biased response which is completely unnecessary for a hobbyist beekeeper.

In our area, Long Island, New York, beekeepers are hobbyists. We winter in two brood chambers. If at the start of a honey flow, we reverse our deeps, thus placing the queen on the bottom, and add a shallow honey super at the same time we generally do not have any problem with brood in our honey supers. What actually happens is the bees fill that honey super and a portion of the second deep with honey before the queen has a chance to work her way to the honey super. Once a super of sealed honey is on the hive the queen will tend to stay below it. Thus the honey super acts as a very efficient queen excluder. I have seen a bee yard with 15 to 20 colonies set up this way without any brood in the honey supers.

On occasion, with a light honey flow or a very determined queen, the honey

barrier in the second deep is exhausted and the queen may lay in a portion of the first honey super. So what! If you want to remove some honey you leave the first super alone and take the supers above it. With the next honey flow the queen will be driven down and when the brood hatches out you can remove that last super. If you don't get enough honey flow to fill that super then you haven't enough honey in your second brood chamber either and you had better leave it on. By this time you may be getting close to the end of the season and you had better be thinking of winter food....Yes, it may be the middle of July but if you haven't got it now, in this area, chances are you've had it for the season. That honey super that you have been so worried about getting dark combs in, is going to stay on the hive all winter and wind up full of brood and dark comb next spring.

So you have some extracting combs that are a little dark. No one has been able to prove that it makes one iota of difference in the quality of extracted honey produced. In fact, your wax will probably be stronger and hold up better to extracting.

This system probably won't work for many commercial beekeepers but a hobbyist who doesn't have to be restricted with a timetable certainly should give it a try.—Fred Munzer, E. Northport, L.I., N.Y.

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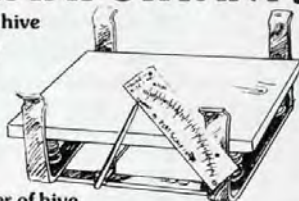


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The Queen Honeybee

By GRANT D. MORSE, PH.D.
Saugerties, N.Y.

Part I

THE WORD "queen" has a nice sound. It seems to refer to an object that is unusually attractive.

This thought is confirmed by the royal quality of the one honeybee in each colony designated as the queen. She even looks queenly, being considerably longer and larger than a worker; also longer than a drone, but not so broad as a drone.

Few observers would declare that any other individual in the colony is so fine in appearance. Nature has endowed the queen with longer life than her nestmates. She often lives 2-3 years, occasionally longer than that, but usually loses part or all of her egg laying proficiency after the second or third year.

Honeybee queens are not alone in their significance. The female in any household, including that of man, is a most pertinent factor in determining the quality of the individual home.

Observations by researchers reveal that the first queen to emerge in each honeybee nest will usually succeed in stinging to death her younger rivals. Here again, we have evidence, as with most females of any species, that they are not mere mollycoddles. The workers do not normally intercede except when they wish to retain additional queens to head swarms following the first swarm.

Young queens usually mate on the 8th, or 9th day of their young life. They begin laying at various periods ranging from the first to the seventh or eighth day after mating.

The workers in a honeybee colony do not seem to be more than casually interested in a young queen until shortly before the time arrives for her nuptial flight. At such times some observers have seen workers seeming to propel her into flight. Prior to the nuptial flight she is not treated, usually, as a special individual. For example, she must feed herself prior to mating; afterwards the workers usually feed her.

Where Should Queens Be Reared?

After some experience most beekeepers find that their queens should be reared in strong colonies.

One pertinent reason for this is that workers must make thousands of visits to each single worker larva to feed and nurture it. Snelgrove (1949) says such visits by workers to a single larva may total about 10,000 during its five days of unsealed existence.

We can deduce from this fact that units placed above a regular colony for the purpose of rearing one or more queens need to be well populated. Many such units lack adequate numbers for this purpose.

To confirm the fact that the feeding problem confronting worker bees is prodigious, Snelgrove indicates that research shows that a worker larva increases its original weight 6-1/2 times during the first 24 hours, and 1,576 times during the 4-1/2 to 5 days of its existence as an unsealed larva.

A further interesting fact pointed out by Snelgrove is that all of the food taken in by the worker larva through its mouth (not its skin, as some think) is absorbed. This is partially because the worker larva's stomach is not yet connected with its intestines. Accordingly, there are not current feces.

At the beginning of the third day of larval life of the young honeybee that is destined to become a worker the feeders add honey and undigested pollen to the larva's diet. In the diet of a larva destined to become a queen, however, a rich allotment of secreted food is continued, thereby encouraging the development of the ovaries of the queen-to-be.

So-called royal jelly is traditionally fed to the larva that is destined to be a queen. This is a product of the pharyngeal and mandibular glands of bees called nurse bees. They range in age under normal circumstances from six to fifteen days.

Toward the end of the fifth larval day, the queen larva receives its last bit of direct feeding, and is sealed in its cell. Food is, however, supplied in advance in the queen cell so that she feeds herself there, and actually increases her weight. The worker larva, on the other hand, is not provided with such food. It spins its cocoon and gains no weight during the pre-pupal stage. Queen cells often show the presence of surplus, unused food after the queen hatches.

The pupal stage (following the spinning of the cocoon by the young queen-to-be) lasts five days. In cases where the colony workers elect to do so, young unhatched queens are sometimes retained in their cells for as long as three days. Such retained queens often go out with second, third, or fourth swarms. A friend of mine who rears quite a number of queens informs me that he has more than once noted a retention of such queens as long as 5 and 6 days. Such retention was **not** due to inclement weather.

The first-born queen usually destroys her younger sisters unless restrained by the workers from doing so. Under the supersede process, the new-born queen often tolerates the presence of her mother for a time, but not indefinitely. The

retention of the old queen during the period of the colony's production of a new queen would appear to be a wise provision of Nature to assure at least a minimal number of eggs during that period.

Until mated, the young queen feeds herself from available colony supplies of honey and pollen. After mating, the colony workers usually feed the queen.

Repeated research on the subject of mating of young queens, reveals the following facts. Young queens reach a minimum age of six days, as a rule, before mating. Most queens mate with one or more drones on their first mating flight. Some take more than one such flight, usually on successive days. Queens find drones coming to the nearest drone flight areas from distances of two miles or more.

Huber (1787) said that confinement of young queens up through the ages of 22-23 days prevents their successful mating and relegates them to drone laying for the rest of their lives.

Heredity in Honeybees

It is difficult to maintain a pure race of bees for reasons which we shall try briefly to explain.

One reason is based on the uncertainty in nature of controlled matings, as is otherwise the case with most other animals. A second reason is that the male honeybee, the drone, has no father, and therefore inherits from the mother the characteristics of her parents.

Changes in plants and animals take place largely through mutation. Mutation consists of a revolution in the kind of genetic quality and arrangement inherited by an individual. These genetic changes take place very infrequently—less often in honeybees than in most other animals—because it is only in the two individuals among thousands in the nest, the queen and the drone, that mutations count. A favorable mutation in a worker could do no more than improve colony performance for one generation.

Even when a gene mutation occurs, if it is of a recessive nature (as most mutations are) its influence upon the nature and quality of an individual animal does not become active until this individual produces offspring with another individual which possesses a similar recessive gene.

Dominant characteristics such as color, docility, proneness to swarming, are transmitted to descendants according to a pattern which is known as Mendel's law. If both parents are pure bred, i.e., if they both possess the same genetic characteristics, the offspring will usually breed true, will transmit their uniform qualities. If the two parents are genetically different, the first generation of offspring will be either like one of them (in individual detail such as color) or of a blended nature—intermediate between the two. A characteristic such as color, which appears consistently in the first generation of offspring is called dominant. However, the non-dominant color characteristic, the recessive character, will appear in some members of later generations.

Because of the parthenogenetic inheritance of the drone honeybee, we have a further genetic problem in determining the characteristics of the descendants of a hybrid queen. It is very difficult to secure offspring of a hybrid queen which will breed true. For this reason, breeders who would produce queens with so-called pure bred characteristics should select pure stock.

Inbreeding

If one wishes to produce progeny that have similar characteristics, he should breed from closely related individuals. If such parents possess similar recessive genes of an undesirable nature, these recessive qualities may be emphasized in the offspring. In order to lessen the appearance of undesirable recessive qualities in offspring, parents exemplifying only the most desired features should be bred so far as they can be identified.

If inbreeding produces weaknesses, as it is likely to do after a time, it becomes

necessary to resort to outbreeding. This usually brings increased vigor to the first generation offspring, but unfortunately introduces much uncertainty as to what future descendants of such offspring will be. That is why we seldom breed from hybrid seed.

One frequent resort by breeders is to outbreed between individuals of the same race whose ancestors have not lived near each other in recent years. After securing offspring from such ancestors, a period of inbreeding may be advisable.

A further complication in transmission of qualities and characters by honeybee queens lies in the fact of her multiple mating, as well as the fact that the qualities transmitted to her offspring by her drone mate are solely those of the drone's mother.

Some authorities believe that there is a tendency for queens of one race to mate more often with drones of another race than with those of their own. This I

would doubt except as the drones of a different race may be more agile. In this respect it is interesting to consider the relative frequency of matings by Africanized drones that are a bit smaller in size than competing Italian drones.

Environment has some influence, it is believed by most biologists, on gene performance. For example, a race of honeybees that is transported to a different environment may adapt itself somewhat. If it is returned to its original environment, however, it tends to revert to its previous behavior.

Such adaptation is often slow and disappointing. However, for example, in an Italian bee which is operating in the cooler areas of the United States, there is a tendency for it to continue to produce brood earlier during the winter months than may be desirable.

Next month, Natural Selection, Swarming, Supersedure and Queen Rearing.

The Andes Pollen Trap

By MANUEL CHEPOTE MALATESTA
Student Agri. Technical Institute
Ohio State Univ., Beekeeping Tech.
Wooster, Ohio

A NEW EASY way for the collection of pollen begins with the "Andes Pollen Trap". While in principle the Andes Pollen Trap is similar to other traps, its advantages make it superior.

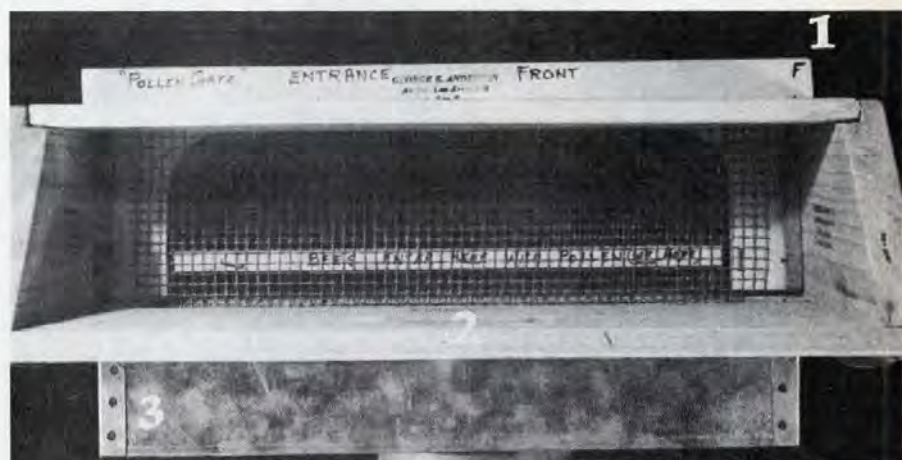
In March, 1976, while traveling in Argentina for the purpose of getting in touch with everything I could about bees, I had the opportunity to visit one of the bee supply equipment companies, "El Panal". Among the several items for sale I found a pollen trap that was simple in design, of light weight, inexpensive and different in shape. I decided to carry it back to Peru.

At home I showed it to a very good friend of mine, George E. Anderson, the best hobbyist beekeeper in Peru, who is an American with more than 25 years of residence in my country, and more than 30 years as a beekeeper. We were discussing the advantages over the "traditional" pollen traps in use, and how we could improve this unusual model. Mr. Anderson made valuable innovations and the trap was ready to be proved.

The advantages we found in the Andes Pollen Trap are:

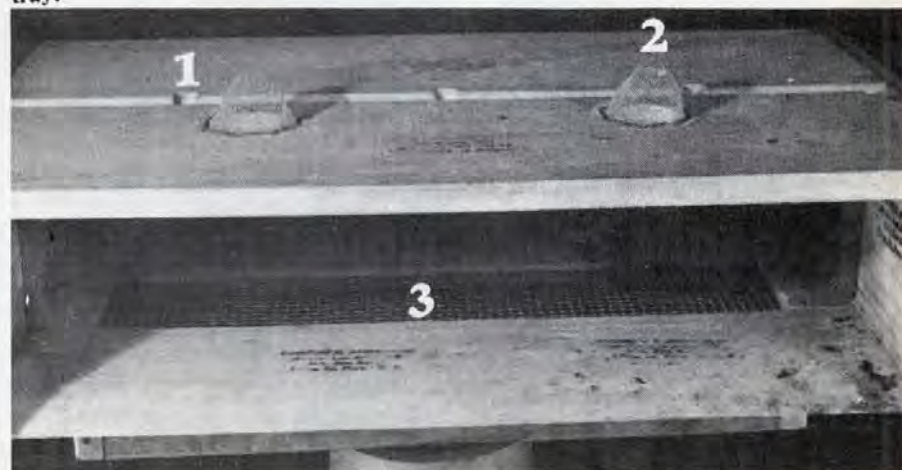
1. It is easy to insert into the landing board. It doesn't take more than 15 seconds and even a young child can do it.

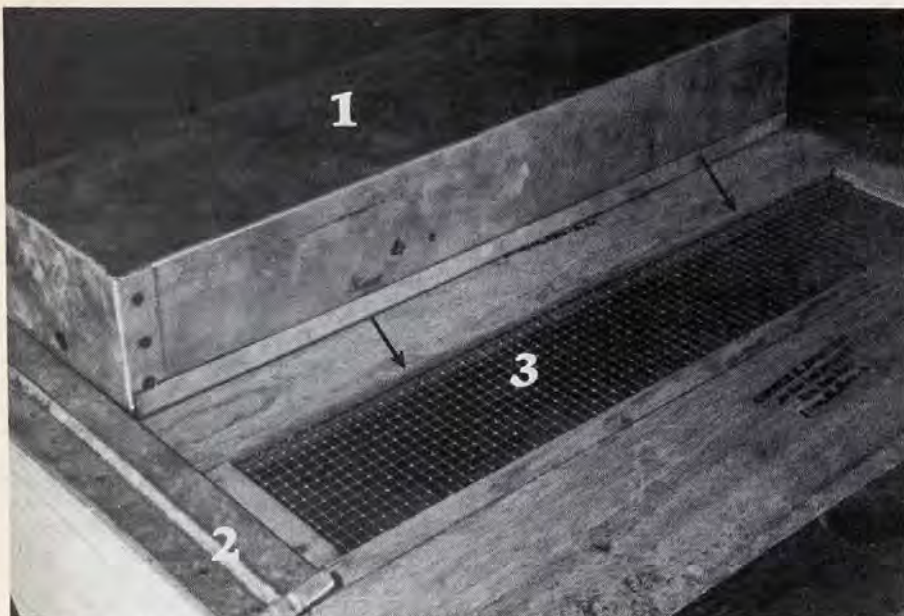
2. It uses very little wire mesh, including two pieces of #5 wire mesh, approx. 11-3/4 inches long x 3-3/4 inches wide (0.300 m by 0.093 m) and one piece of #6 wire mesh, approx. 11-3/4 inches



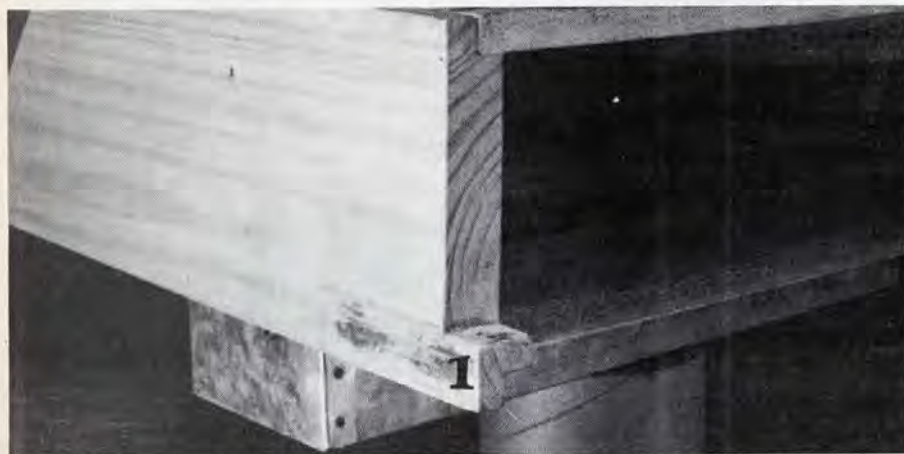
1—Front View. 1.) Double wire mesh #5 Guillotine. 2.) Landing board for bees coming from the field. 3.) Pollen collecting tray.

II—Rear View. 1) Small holes to help stray bees go through the guillotine. 2) Drone cups help drones to go out of the hive. 3) Wire mesh #6 over the pollen collecting tray.





III—Bottom View. 1) Pollen tray. 2) Slats help to slide the pollen tray in and out. 3) Wire mesh #6 allows pollen to fall into the tray, small enough so bees can't go in.



IV—Rear Side View. 1) Pollen trap wedge in both sides to insert into the hive entrance helps to hold the trap straight.

long x 2-3/4 inches wide (0.300 m by 0.070). The numbers (#5 and #6) tell the number of square holes per inch.

3. It is very light in weight and simple in design and does not violate the bee space between brood chambers.

4. It is small, with a width of approx. 15-1/2 inches (0.370 m) a depth of approx. 12-1/2 inches (0.320 m) and a height of approx. 4 inches (0.100 m). It is also easy to handle.

5. Its pollen collecting tray has a length of approx. 12 inches (0.305 m) a width of approx. 3-1/4 inches (0.085 m) and a depth of approx. 2 inches (0.053 m). It is easy to insert and remove from its glides.

6. Bees do not get vicious when a person is inserting or removing the double #5 wire mesh "guillotine" for pollen collecting purposes. The guillotine is approx. 13 inches (0.328 m) long and

approx. 4-1/2 inches (0.116 m) high. (Single #5 wire mesh can also be used at one's own discretion.)

7. It is not necessary to remove the trap when not collecting pollen; only the guillotine should be removed. (It then forms a deep covered entrance which is an aid to prevent robbing and draughts.)

8. It has special holes with cones on the top for drone escapes when the "guillotine" is in use, collecting pollen.

9. By adding a small wire mesh box on top of the drone escapes, you can trap queens and swarms during the swarming season or drones that you may want for artificial insemination, or you can eliminate as you see fit.

10. The Andes Pollen Trap is reasonably priced.

Two other advantages to the trap are

that the amount of pollen you can collect depends upon the pollen availability of each area. And, also, the trap applies the principle of the vertical #5 double layer guillotine and horizontal #6 wire mesh to collect the pollen.

Last winter, I began my studies at The Ohio State University Agricultural Technical Institute in the Commercial Beekeeping Technology. Soon I realized that the pollen traps used at the school were the traditional models, so I asked Mr. Anderson to send me the Andes Pollen Trap. In the spring of 1978, at ATI, we tested the traps. Although pollen was not abundant at the time, the results were "terrific", the same as in Peru. Since Argentina and Peru are, among other things, linked by the Andes chain of mountains, I think the name "Andes Pollen Trap" that Mr. Anderson gave this trap is appropriate and by coincidence, an abbreviation of his family name Anderson to Andy, and so, "Andes".

I would like to thank once again the Argentinean beekeepers for the kindness shown me during my visit to their country.

The same appreciation goes to George E. Anderson for giving me many valuable suggestions on the proper management of my apiary.

Now that the world is demanding large amounts of pollen, here you have an easy way to get it from your bees. Try the "Andes Pollen Trap" and convince yourself—you will be a happier beekeeper. A suggestion: let the bees have some of their hard earned pollen by removing the "guillotine" every three or four days for a day or so. If not, you will be a sorry loser with half empty supers.

More information about the "Andes Pollen Trap" can be obtained from George E. Anderson, AV. de las Artes 558, Urb. San Borja, Lima 34, Peru, S.A.

FLETCHER 4-H'R



"THE BUSINESS IS NEVER INTERRUPTED... MY EMPLOYEES, THE BEES, NEVER GO ON STRIKE."

American Honey Producers Convention-1979

By LOIS MOORE
Marysville, Ohio

FEBRUARY 4th found members of the American Honey Producers Association bucking snow and cold temperatures to attend the Tenth Annual Convention at St. Louis, Missouri.

Jack Meyer, Vice-President of the Association, called the convention to order with prayer offered by a member of the Missouri Beekeepers Association. Tuesday was dedicated "Missouri Day", recognizing the 700 beekeepers in their state. They presented the program for the day.

Dr. W. T. Wilson, ARS, USDA Laramie, Wyoming, spoke on pesticides being researched with federal grants. He showed slides of his work in Wyoming and Montana and discussed different types of equipment to see bees through applications of pesticides. One type was a shade for beehives in Arizona enclosed with canvas to keep the bees from flying. Burlap bags over the hives will keep the bees in and provide air. It is important to put on pollen traps for 24 to 48 hours after application of pesticide to insure infected pollen does not reach the hive. If bees are damaged, sugar syrup and pollen cakes will rear brood quickly, but the honey flow may still be lost if the colony doesn't have enough time to recover.

Dr. Eric Erickson, Russel Laboratories, Madison, Wisconsin, showed slides of his work in soybean research. He explained the parts of the soybean flower and how the bee gets the nectar from the flower. Several varieties of soybeans are showing much promise as nectar producers.

Wednesday morning Vice-President, Jack Meyer called the meeting to order. Charles Willis welcomed us to St. Louis and informed us of the points of interest in his state. Berna Johnson responded to the welcome.

Jack explained the problems to the beekeepers in the field of research when President Carter enacted the budget cuts. Also, he told how the national gas shortage would affect the beekeeping industry. He expressed his thanks for the support of all the American Honey Producers members and welcomed others of like interest to join the Association.

Dr. E. C. Martin, National Programs Staff, SEA, USDA gave the Bee Research report from Science and Education Administration. They found night applications and short residual type pesticides should be encouraged.

Phil Gray, EPA, Washington, D.C., explained the Environmental Protection Agency's responsibility to beekeeping. The EPA works with the chemical

companies to ensure the bee's safety when the product is put on the market. Then it's effects are monitored as the product is put into use. Sevin and Penn-cap M have shown highest kills. It takes a year or more to check out a product. Therefore, he asked our patience and support. Data is still being collected on Penn-cap M and other types of capsulated pesticides. Beekeepers are urged to report bee kill from pesticides to the EPA. The Wyoming Bee Lab is being set up to receive samples of affected bees. Have a third party—ASCS Representative, County Agent, Vo-Ag teacher, veterinarian, or the sheriff collect the sample and store it in a freezer stating date and time of collection. The sample can then be shipped to the lab in dry ice. Do not collect the sample yourself. The disinterested party is to verify the sample.

Berna Johnson, Executive Committee, Socorro, New Mexico reported on our congressional receptions. Everyone agrees the receptions have been a success but this time the reception took on a different twist. We did not tell Congress what we wanted—they told us on what issues to keep them informed. Real progress is being made in this program. We want to thank everyone who has helped in this endeavor. It is expensive but very well worth the time and money.

Richard Adey, Past AHPA President, Bruce, South Dakota, reported on the National Honey Act. In 1976 ITC found that the honey industry was being damaged by imported honey. In 1977 a resolution was adopted to ask Congress for a Honey Act similar to the Wool Act. On December 1, 1977 Congressman Larry Pressler of South Dakota introduced the Honey Act Bill into Congress. The Bill died because of a disagreement between AHPA and ABF over compulsory check off. On February 1, 1978, the AHPA and the ABF met in Kansas City, Missouri to work out differences. The AHPA came away with three options: 1. Accept the National Honey Act with referendum. 2. Accept the National Honey Act without the referendum. 3. Drop the National Honey Act altogether. The referendum was to have a compulsory check off program.

Jim Robins, AHPA Director, Kennett, Missouri, explained how beekeepers can help themselves by lobbying for the laws they want passed. Write brief, one subject letters to your congressman. If you call the congressman, talk only on one subject. Remember an aid can be as much help as the congressman. Contact your congressman occasionally informing him of new matters and that you are still out here and interested. Mentioning

another congressman may be the wrong thing to do.

Richard Adey, honey producer, expressed views and ideas on the pesticide problem and how to deal with it. Although no definite answer was arrived at, the problem was better understood and many avenues have been opened. Some progress is foreseeable in the near future. Richard Adey, in summing up the two-day seminar stated, "The beekeeper, farmer, applicator, and the chemical company have to be accountable for their individual actions and combine research and education."

Jim Smith, Finance Chairman, briefed the Association on the importance of supporting the AHPA's many necessary projects for the honey producer.

Kenneth Moore reported on the membership status of the Association.

Glenn Gibson, Secretary, AHPA, gave the annual secretary-treasurer's report. The resolutions were set in order and the meeting adjourned. A Board of Director's meeting followed.

Richard Adey, Bruce, South Dakota, was master of ceremonies for the banquet with David Unger, Deputy Assistant Secretary of Conservation, Research and Education, USDA being the evening speaker.

The Executive Committee met Friday morning selecting Hawaii as the location of the 1980 American Honey Producers Association Convention and inviting all honey producers to attend.

The new officers for 1979 are President Jack Meyer, Jr., 202 North West 7th, Madison, South Dakota 57042; Vice-President Berna Johnson, Socorro, New Mexico; Glenn Gibson, Box 368, Minco, Oklahoma is Executive Secretary.

1979 Policies of The American Honey Producers Association, Inc.

1. The AHPA continues its opposition to national marketing orders for honey.

2. The AHPA endorses such methods of promoting honey at the national level as are being used at the local levels at county fairs, state fairs, 4-H, Boy Scout programs, schools, FFA, and several different social organizations.

3. The AHPA supports the U.S. Department of Agriculture's expanded research program in the methods of controlling injurious insects.

4. The AHPA opposes the eradication of any honey plants.

5. The AHPA favors the use of honey plants on acreages diverted by government programs for wildlife reserves, U.S. Forest areas, set aside acres, reclaimed lands, and highway rights-of-way.

6. The AHPA requests the U.S. Department of Agriculture to continue studies on the "disappearing disease".

7. The AHPA opposes the improper use of the word "honey" on all imitation honey packs and syrup blends and urges all state and local beekeeping associations to sponsor legislation in their state making it unlawful to package and label any product as honey or to sell or offer any product for sale which is not pure honey. We also urge beekeepers to check for possible violations and report them to their state agencies and the Food & Drug Administration.

8. The AHPA urges its members to prominently display the following sticker: "We Belong To and Support the AHPA".

9. The AHPA will sponsor a Congressional Reception in Washington, D.C. during 1980 or 1981.

10. The secretary is hereby authorized to cooperate and assist any group in getting federal grants for needed research on any project that falls within our general policy goals for research.

11. The AHPA urges the changing of I.C.C. regulations to permit full utilization of truck on return hauls and supports the regulation of the trucking industry.

12. The AHPA opposes the appropriation of funds to implement Sections 3 & 4 of Senate Bill S-18.

13. The AHPA urges the entire membership to give full support to the Commemorative Stamp Committee.

14. The AHPA will continue to do everything in its power to restrict imports either through an ad valorem tax and/or quotas.

15. The AHPA requests the USDA to continue work on wax moth control.

16. The AHPA requests the USDA's Extension Service to publish more information about honeybee pollination in all farmer's bulletins, news releases, farm journals and garden clubs.

17. The Secretary will write "thank you" letters.

18. Direct the secretary to ask the postal authorities to extend insurance coverage on all package bees and queens mailed in the United States and increase insurance if necessary.

19. The AHPA asks the Secretary to continue our contact with accuracy in media and request their help in combating

adverse publicity.

20. The AHPA recommends that Congress enact legislation for the honey industry similar to the wool program.

21. The AHPA will continue contact with EPA asking for assistance where possible.

22. The Secretary is hereby authorized to make a study of all current bee research projects of the U.S. Department of Agriculture.

23. The priority recommendation is the need to establish an extension apiarist for bee research, development and protection within USDA.

24. The Interagency Bee Protection Task Force which was established in 1978 should deal with many issues involved in focusing USDA's activities relating to bees and beekeepers.

25. EPA, USDA, and other Federal agencies should consider the potential of using the 700 hour summer hire program to reinforce ongoing research on bee protection.

26. EPA and the states should increase their efforts in working cooperatively with regional EPA offices in order to sharpen the accuracy and effectiveness of reports involving bee kills.

27. USDA and beekeepers should cooperate in getting information to garden clubs on the importance of pollinating insects, particularly bees.

28. Urge the USDA through its Cooperative State Extension Services to incorporate into their training programs for applicators materials which are available outlining the hazards of pesticides to the honeybee.

29. Urge the EPA to pay closer attention to the apparent efforts of certain chemical companies to circumvent federal registration process by attempting to obtain Section 24 (c) registrations in a number of states. If regulatory action is required EPA should take it.

30. The Interagency Bee Task Force should make an effort with AHPA support to enlist cooperation of the National Agricultural Aviation Association to develop training materials for agricultural aviators so that these skilled pilots can best use their talents and technologies to better protect bees.

31. Ask the U.S. Congress to include money in the fiscal year 1980 budget to fund the beekeepers indemnity program and the soybean research program.

32. Ask the SEA-USDA to commence a program of analyzing bees and combs for pesticide residue at the Laramie Bee Lab.

33. AHPA recommends that all mem-

bers urge farmers or applicators to seek advice on pesticide use from their county extension agent or other qualified public official rather than from salesmen representing chemical companies.

34. AHPA urges EPA to review carefully any applications for registration of micro-encapsulated pesticides for evidence of hazard to bees.

35. The Interagency Bee Task Force which was established in April 1978 should be encouraged to pursue its various activities. If possible, the AHPA would like to be represented at meetings of the task force.

36. In its review of carbaryl under the rebuttable presumption against registration process, EPA should take into consideration carbaryl's toxicity to bees, which has resulted in numerous bee kills during recent years. AHPA will assist in developing supporting data.

37. Urge USDA to stress the value of honeybees in IPM programs.

38. EPA should expedite its efforts to develop a test protocol incorporating acute toxicity data and re-entry intervals for bees into its registration guidelines.

39. Ask the USDA to continue the price support in its present form.

40. Urge all AHPA members to contact their state level EPA offices and ask them to place emphasis on the enforcement of use consistent with instructions on the labels of pesticide containers.

41. If a fuel shortage develops, the AHPA will contact the proper administrative agencies and ask that sufficient fuel be made available to beekeepers.

42. Ask the EPA to change wording on PennCap label to say—"This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply PennCap-M, or allow it to drift, to crops or weeds in bloom on which bees are working."

43. Urge the Science Education Administration, USDA to fill vacancies that occur at the bee labs as quickly as possible so that bee research work can be continued uninterrupted.

44. The AHPA president will appoint a committee to visit the Baton Rouge Bee Lab and make a thorough study of the current research program and consider ways and means to open better lines of communication between the bee industry and the genetic bee researchers at this facility.

45. The E.P.A. is requested to advise the AHPA of the step-by-step actions necessary to preserve as evidence in a court of law or other proceedings any

(Continued on page 261)

Honey Plants

By WILLIAM G. LORD
N.C.State University
Raleigh, N.C.

Beekeeping In The North Carolina Piedmont

THE PIEDMONT region of North Carolina finds itself in the position of being a beekeepers' valley of humility between two mountains of conceit. The conceit comes from the coastal plain region which supports the state's commercial beekeeping industry and the mountain area of the state, producer of the renowned sourwood honey. The Piedmont cannot in fact boast of any outstanding beekeeping opportunities, but it is nonetheless a good area to keep bees. This area contains the major urban areas of the state, but at the same time surprisingly it also includes a large percentage of the state's 200,000 hives and 30,000 beekeepers.

Beekeeping is almost exclusively a hobbyist venture in the North Carolina piedmont. Honey yields are not large, but are usually consistent from year to year. The year begins with the maples (*Acer* sp.) in late February and early March, along with a profusion of flowering ornamental shrubs (*Chaenomeles speciosa*, *Ilex convexa*, etc.) and dandelions (*Taraxcum* sp.).

The mainstay of the Piedmont honey flow is tulip poplar (*Liriodendron tulipifera*). This stately tree consistently yields an amber honey with an excellent flavor from its large, cup-shaped flowers and extrafoliar nectaries. Being a tree, it is rarely affected by frosts or drought, and

Sourwood (*Oxydendron arboreum*) produces excellent honey in mountain regions of N.C.

Tulip poplar the primary predominant honey plant.



its yield is usually diminished only by excessive rainfall during its period of bloom. In addition to poplar, hairy vetch (*Vicia villosa*), blackberries (*Rubus* sp.), and common sumac (*Rhus glabra* L.) provide excellent nectar sources for the spring honey flow. Fruit trees and many herbaceous plants such as white Dutch or Ladiño clover (*Trifolium repens*) and sweet clover (*Melilotus* sp.) supplement the spring flow, and many bloom on into summer.

The summer season is heralded by the blooming of sourwood (*Oxydendron arboreum*) in early July, though surplus yields of sourwood are usually confined to the foothills and mountains of the state. Asters (*Aster* sp.) and goldenrod (*Solidago* sp.) begin blooming in late August, and many continue to bloom and yield through late October. Sumac (*Rhus typhina*) blooms throughout the summer and fall, and may occasionally provide

surplus honey. *Camelia sasanqua* and *Osmanthus fortunei* are two flowering shrubs that complete the season by blooming in late fall and early winter.

Honey yields in the Piedmont are not known for their size, but the honey that is produced can be sold at a premium price to a ready market. Tulip poplar honey sells extremely well in this region as a table honey, as many of the people have

Hairy Vetch was once a major honey plant (1930's) now a minor plant in N.C.



grown up using this excellent honey which is often relegated to a bakery grade because of its amber color. With a large number of hobbyist beekeepers, the Piedmont also provides an excellent market for queens, packages and bee supplies which is being supplied by the expanding beekeeping industry throughout the state. The North Carolina State Beekeepers Association (1,500 members) draws its primary support from the Piedmont region of the state, and members from this region have been instrumental in establishing a graduate assistantship at N.C. State University to support research to the benefit of beekeeping as a whole. In fact, the NCSBA was the driving force in establishing the apiculturist and apicultural program at N.C. State University.

Hobby beekeepers such as those found in the Piedmont of North Carolina rarely make headlines, but these people provide tremendous support for beekeeping as a whole. A hobby beekeeper casts the same vote as a commercial man in our political

Blackberry, an excellent secondary honey plant.



process, and as such is a vital link in the rich and continuing heritage of beekeep-

ing in North Carolina and the United States.

The Transferring of Bees

By HOWARD J. ROCK
Dale, Wisc.

I BEGAN to keep bees during the twilight period of the box hive era. During the late '20's, just prior to the great depression, this part of the country had a well established inspection service and there were state laws insisting on movable frame hives. In spite of this there were still many small farm apiaries of one to ten hives that escaped the inspector's notice, either by accident or design. Back in those years the farmer was still lord of the manor and anything smacking of government interference was greatly resented. However, the inspectors of that period were mostly well adjusted men, very tolerant and helpful, so, among the tools of their trade they would have a machete or key hole saw and unusual skills in the art of persuasion.

These small farm apiaries were not bona fide box hives in their entirety, many of them being factory made hives that had known many years of neglect and abuse. They were heavily propolized and had more than their share of burr comb, cross comb and drone and transitional cells. De facto-wise, they were all box hives.

Usually the inspectors would encourage the purchase of new factory equipment and, being helpful, would return later to supervise the transfer of the bees. There were two general methods of transferring, either directly or indirectly, the latter taking several weeks of waiting.

In the direct method, the box hive was set to one side and the newly assembled

"As late as the 1945 season it was common for my landlady in south Georgia to inquire, 'When are you going to rob the gums?'"

hive with full sheets of foundation was put in its place. A gallon pail of sugar syrup was placed over the hole of the inner cover to insure that the bees would immediately begin comb building with a minimum of drone cells. Then the box hive was tipped with the bottom adjacent to the entrance of the new hive.

The next step always fascinated me. The bees were heavily smoked, the fuel being oily rags obtained from a nearby garage or a punky oak stump was sought. If the oak stump was in optimal state of decomposition, one could slice off suitably sized chunks with a sharp hive tool as easily as cutting butter.

There is an art in smoking bees, even heavy smoking during transferring. The smoking was accompanied by a persistent but gentle drumming on the sides of the box hive. The operator had to concentrate on his work as there is a certain "threshold of hopelessness" as one old English beekeeper explained and also a unique, characteristic sound which is common to "driven bees". When this point is reached, the bees leave their old home with the precision of a regiment on parade and will enter the new hive on the old stand. As they have gorged themselves with honey, plus the sugar syrup at their disposal, comb building goes ahead very rapidly.

If one were to drum and smoke excessively, as many bee handlers are inclined to do, one would only succeed in producing chaos. One had to draw a fire line.

Many times, instead of driven bees, the box hive was opened carefully with an adequate crowbar and the best combs were cut out and secured in empty frames with twine or rubber bands cut from an old inner tube. In fact, this method was used much more than any other. Perhaps it is best for the bees themselves but I always objected to having such poor comb, even for a little while, in the new hive. However, some of these "piece meal" combs were not bad.

At the beginning of the depression a considerable number of commercial producers from the North decided to establish branch apiaries in the deep South. Usually, on moving in, they would buy up all the box hive and gum apiaries within a thirty mile radius and most of the box hives were transferred by cutting out the best comb and securing it in the new frames with rubber bands. Morley Pettit, a commercial producer from Ontario, once wrote a most interesting article on his activities along this line. There were others. As most southern homes had fireplaces then, the shell of the box hive would be put on the fire in the evening and the wood impregnated with beeswax and southern gums would produce many colored, almost hypnotic flames to dream away the night with.

I always preferred to transfer bees at a more leisurely pace so I always used the

indirect way. First I would turn the box hive upside down so that the slant of the cells in the comb would be downward, discouraging use by the bees. Then with a small saw I would even out any disparity on the bottom of the box hive, the bottom usually being punky, so that a new super with drawn out worker comb would fit snugly when added on top. In about ten days, especially during the spring honey flow, I would usually find that the queen had established herself in the upper story. Working very gently I would insert a queen excluder that had been modified with three shallow cleats (what is now called a Bailey excluder) between the old and new hive bodies. All entrances and opening along the bottom were carefully sealed and there would be a middle entrance furnished by the cleated queen excluder, facing the front like the old entrance was.

Supers were added as necessary on the top and in perhaps a month, the old box hive set of combs below the excluder would be as empty as last year's bird nest. At best there would be a small area of stored pollen.

On rendering these old box hive combs, one needn't waste the stored pollen. Scrape it out with a hive tool and add it to your favorite pollen supplement formula. Many expert beekeepers, including G.H. Cale, attested to its benefit when added to any pollen cake, maintaining that they obtained better results.

I learned a lot while transferring box hives and neglected hives. Usually you will be working with the most hardy bees of all. They are feral in every sense of the word having endured all the vicissitudes of abuse and neglect imaginable. Under such conditions you may be sure that the bees that you are obtaining are "survivors", bees that can take the cold, scant rations, the threat of disease, etc., I once transferred eight neglected hives that had survived a flood and when I went to get them they had floated several hundred yards from their original location and were still floating in over a foot of water. They turned out very well, way ahead of packages that I had bought that spring.

Years ago, when bee equipment was fairly cheap, there were many small, neglected apiaries that the enterprising beekeeper could pick up for a dollar or two apiece. At today's prices I can't imagine anyone being that careless but if the beginner has his eyes open, who knows what bargains are out there. Not to mention swarms established in buildings of almost every description. There are always opportunities for adventure, at least I like to think so.

Timing is of the essence in transferring, the ideal time being in the spring, during a honey and pollen flow from the willows or the dandelions.

Sometimes direct transfer with cutting out of combs is better, as when transfer-

ring from a building. Indirect methods are best with old hives and there is no better way to exploit the barrier effect of the excluder, which is a must.

The best combs and the most populated colonies were obtained from the "ole black gum" primitive hives in Georgia and northern Florida. I can understand how some southern honey producers achieved outstanding success back in the '80's and '90's. The volume of a hollow gum was as great as that of a Dadant-Blatt hive and if one practiced "Quinby" swarming or padgening, keeping the enormous work force intact, one only had to add sufficient room for the surplus honey. However, I understand that at certain times the brood diseases were devastating, including para-foulbrood.

As late as the 1945 season it was common for my landlady in south Georgia to inquire, "When are you going to rob the 'gums'?", when as a matter of fact we had all modern hives and were engaged in queen rearing and package

production. Old ways and old terminology only die with the generations that used them.

Thomas Jefferson once said that he could only predict the future by projecting the processes of the past. Most modern beekeepers are only familiar with their own time span when a knowledge of beekeeping history would make their work more enjoyable.

I am glad that "I made the scene" in the time span that I did. There was diversity then and one sensed a different atmosphere, a different aura; the people had their unique vocabularies and accents, they did things rather differently, one knew when he was in the far West or deep South. Now everything is rapidly becoming standardized, "homogenized" as one wag put it. I suppose it's because of television, the people have more and they are infinitely more mobile in the utmost comfort. But, "progress" is ambivalent, it is not all for the better. Consider wholesale poisoning, for one.

A Bear Story

By ROBERT PETERS
East Brady, PA.

THE PHOTOGRAPHS illustrate the problem I had with a 300 lb. black bear during the months of October and November, 1978 in Armstrong County, Pennsylvania. The bear visited me on five different occasions during a 30 day period and destroyed an average of four to five colonies each visit.

The Pennsylvania Game Commission came and set a wire line snare trap and caught him on his first visit after the trap

was set. They gave him a tranquilizer which put him to sleep, pulled a tooth to determine his age, marked him and hauled him 75 miles away to another area and released him.

We have a law in Pennsylvania that requires the Game Commission to pay for the damage done to beehives by bears, so I received what I considered a fair remuneration for the damage done.

Bears second visit to R.H. Peters bee yard.





Bear is caught in snare trap, the man in picture is ready to administer the tranquilizer to put him to sleep.



Bear is asleep from the tranquilizer.

Bee Locations

By **ROBERT HORN**
Minneapolis, MN.

THE POET, Robert Frost, in *Stopping by Woods on a Snowy Evening* wrote:

My little horse must think its queer
to stop without a farmhouse near.
The woods are lonely, dark and deep
But I have promises to keep
and miles to go before I sleep.

I quote this because I am somewhere on that road we travel between beginner beekeeper and full-time beekeeper. I cannot give the last word on bee site locations but after having learned so much from other people's experience, I'd like to share mine in the hope some will find it helpful.

My partner, Charlie Crowell, and myself presently operate over 200 hives on the edge of Minneapolis, Minnesota. It all started with the high prices of 1974 and the stock market crash of 73-74. Remembering tales of the depression, I decided it was time to establish a hobby farm and raise my own of everything.

My first bee site cost only \$25,000. Since I have always been interested in bees and sugar was going for 90 cents a pound I thought I'd outsmart the world. The site was bought first and the bee idea was second. In fact, the decision was made in January and before I knew it I had three other friends who also wanted one hive each. Why not?

"By advertising we also had people who wanted us".

This is an expensive way to pick a site and I would not recommend the land purchase if you only want bees. Not much thought was given to terrain or other hives in the area. By luck there were none and there was water and a slope to protect the hives. Getting out the textbooks and multiplying top yield times hives we realized on paper we had discovered gold, liquid gold. We only laughed when one of the four original men departed by running up the hill slapping his body. He never came back.

Since we had read about how to become rich we searched for more sites and came upon an established site that a fellow beekeeper wanted to sell because it was outside of his territory and he didn't want to travel that far with the rising cost of gasoline. This site was near our town and has been an excellent location for us. We bought the hives at a reasonable price and got the location free. You should be on the lookout for any possible problems—spraying or disease—but by carefully visiting with the owners of the farm we found the site to be free from problems, except for one mean colony that trained its bees to get inside our pants. We now had 12 colonies but we lost our third man at this point. He mumbled something about "kids in college" and he moved to California.

With fall upon us we decided we needed

more sites to become bigger and wealthier. Our third way of picking a site was to visit our friend who had expressed a strong desire for hives to be placed on his land. However, before we committed ourselves we decided to be as scientific as possible.

We ordered maps of our area and a plat book which outlined every land owner and every farm. We also decided to advertise in the local small town newspaper and a 5-county insert which went to 55,000 farms. We entered a small want ad which ran \$18.00 for 4 ads. The ad read, "Bee pastures wanted."

We received about 20-25 calls in February. We plotted each one and asked if they knew of any other nearby hives. We had no desire to encroach on another bee pasture because we wanted maximum yield as I'm sure others do. After we plotted each possible location we next visited each site to decide which had the best possible winter protection, water, foraging, etc.

We next went to the state apiarist and looked at their maps to decide if there were any locations that were hidden from the roads. Again our aim was to protect ourselves and fellow apiarists from low yields because of over-crowding. Over

(Continued on page 258)

The Honeybee Knows All The Angles

By GEORGE RITTER

LET'S ASSUME you have just been given the task of putting together a six-million-dollar version of a bionic bee. You're not going to make some kind of superbee, just an ordinary worker version like in any run-of-the-mill beehive.

Obviously you'd need all the anatomical accoutrements like the head, thorax, abdomen, legs, antennae and the like. But let's say you've already got the existing plans for all of these. What you're really interested in is the internal circuitry and black boxes that will be needed for the bee's navigational and guidance system.

For starters, here's a list of equipment you'll need:

- Internal clock
- Polarized-light sensor
- Sun-angle-azimuth computer
- Instrument for measuring true vertical
- Dead-reckoning equipment
- Wind-speed and direction indicator
- Trigonometric calculator and tables
- Air-and ground-speed indicators

Perhaps you think this is a bit extravagant for your ordinary bionic bee. But before you jump to conclusions, consider some of the normal everyday navigational problems which must be solved.

A bee can literally follow its proboscis to nearby flowers, but its pint-sized power of smell obviously has limitations. In order to pinpoint distant nectar and pollen finds something more is needed.

First of all, bees have to know in which direction to fly for those proverbial beelines. Here the basic guidance problem is relatively simple. All the bee has to do is navigate by keeping a fixed angle in relation to the sun. Even on cloudy days they can do this because of their ability to perceive the angular direction of the sun's polarized light.

But there's more here than meets the bee's eye. The sun is a moving point of reference. So the little six-legged pathfinder has to continually "compute" its movement as it proceeds in a given sun-oriented direction.

Bees not only have to work out the solutions to such problems, they have to communicate them to other bees as well. Imagine a scout bee returning to the hive having just discovered a distant trove of flowery nectar and pollen. How does she

tell her fellow workers where the flowers are located? By doing a fancy dance step in front of her sister bees! Distance to the find is indicated by the pattern and frequency of the dance. The further the source, the slower the speed of the dance.

The real genius behind the bee's well-patterned footwork comes in the way she communicates directional information. Let's say the scout knows that the desired target is at an angle of 30 degrees from the sun. She simply rotates the axis for her dance pattern 30 degrees from the true vertical!

Even more remarkable is the fact that, during the dance, the bee will adjust the angle to compensate for the sun's movement through the sky. And this process all takes place within a darkened beehive!

Now how did the lowly honeybee make such a great intellectual leap? Who taught it to mentally equate deviation from the vertical with relative bearings to the sun? How did such a tiny creature learn to equate sun angles and distances with dance-step routines? How does a bee "learn" to quantify concepts like distance, time, and direction? Where did the internal time clock come from? If one bee came up with this mind-boggling scheme all by herself, how did she get the rest of the hive to understand her language?

If that weren't enough, consider some of the other complex navigational problems bees have to solve once they learn the location of a flower find. Often natural obstructions require the bee to fly a dogleg course to reach its desired target. Again picture a scout returning from a flowery find having made a large in-flight detour (in order to avoid objects like houses, trees, or hills). She then communicates the direction based on, of all things, the straight-line course to target! Now that's quite an achievement, considering the bee never flew in that direction either leaving or returning to the hive! Yet somehow she makes the correct "trigonometric calculations" for her fellow workers. They, too, successfully fly the dogleg, figuring out all the distances and angles along the way.

During actual flight, bees have to reckon distance flown over the ground versus movement through the air. This becomes critical when one is trying to fly a proverbial beeline, but is being buffeted by a crosswind. Somehow, just like an

experienced navigator, the bee has to compensate for the crosswind drift.

Again, all the aeronautical equipment necessary for these complicated calculations is built right into the bee's tiny anatomy. Its multifaceted eye can measure speed over the ground by making direct visual checks. Relative wind movement is detected by means of sensitive hairs located on the eye. The bee's tiny brain then compares the two measurements and comes up with a corrected "course to station".

Bees will even "ground" themselves under adverse weather conditions. If a stiff headwind is blowing, they could easily end up flying backwards trying to track down a particular group of flowers. They avoid this rather awkward aerial exigency by using their own mini-weather-advisory system. Before takeoff, bees will measure wind speed with their antennae to determine if it is safe to proceed.

Bees also have to work out a daily "flight plan" based on the amount of light available and the season of the year. For most efficient operations, first takeoff should occur early in the morning to allow for the maximum "time on station" gathering nectar and pollen. But a premature departure will mean insufficient light to work by. Bees get around this problem by using their eyes to gauge optimum departure time, much like a photographer would employ his light meter.

In the evening, flight timing becomes much more complicated. If the bee leaves for her last trip when the light is at the same intensity as it was for her first morning departure, she's likely to come home groping in the dark. Part of the remaining light will be consumed in getting to and from the target. So the bee correctly calculates that the last flight in the evening can only take place with the light intensity slightly brighter than it was in the morning. As one author put it, this is "an astonishing instinctive calculation of things to come, considering the smallness of a bee's brain."

Perhaps it's not so astounding when you consider who designed all the miniaturized circuitry in the first place. By comparison, consider for a moment the remarkable strides man has made in the field of micro-miniaturization in the last few years. Most of it took the

(Continued on page 258)

Production of Quality Queens

This is a reprint of an article in the April, 1967 issue of *Gleanings in Bee Culture*. The original article appeared in the *Australasian Beekeeper*. The author J.E. Hastings is deceased but his methods are as good today as ever. The Hastings family business of producing queens is presently at the same location in Birch Hills, Saskatchewan, Canada.

QUALITY QUEENS are an absolute necessity, if colonies are expected to reach sufficient strength in time to take full advantage of any anticipated nectar flow. Quality queens must not only be reared by the best available methods, but must be bred from gentle high producing strains with little or no desire to swarm, even under crowded conditions.

As it is the purpose of this article to deal with methods designed to produce top quality queens let us first examine the methods used by the bees themselves when their queen must be replaced for various reasons.

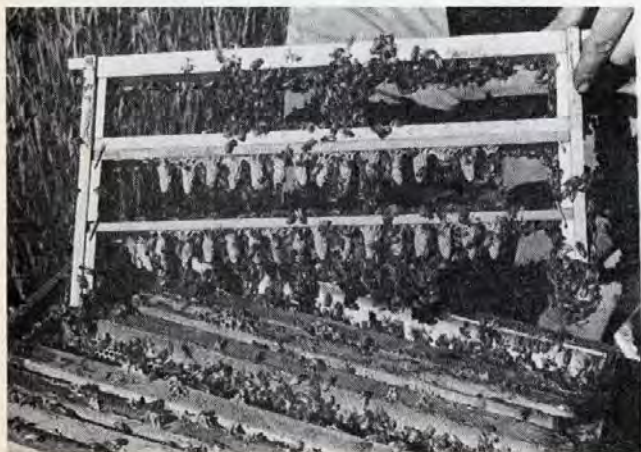
Replacement of the queen in a colony falls under three main categories; emergency, swarming and superseding. Let us examine each category separately and the resulting queen.

Emergency

When a colony suddenly finds itself queenless, preparations immediately take place to restore the individual so vital to their existence. Conditions such as lack of nectar, abundant pollen and young bees, so necessary to ideal queen production, cannot be taken into consideration; it is now or never.

Several larvae, within the necessary age range are suddenly fed abundantly with royal jelly; their cells stretched and extended downward to form queen cells. It is interesting to note many of the chosen larvae will be near the maximum age at which they can still be transformed into queens. Prior to this, they had only

been fed scantily, as is all brood intended to become workers, but on a jelly of a different composition than that required by queen larvae for best results. Naturally, under the above conditions the resulting queen will have come from one of these larvae of advanced age, being the first to hatch and in a position to destroy all her sisters in their cells. When fully matured, queens of this type are usually small and unable to reach maximum egg production, their life span as a rule is short in comparison to properly reared queens. True, we do on occasion find exceptions to the above, but any better quality queen usually results from a colony finding itself with only eggs or very young larvae upon the queen's disappearance.



Queen cells are ready for removal from the cell builder and distribution to mating nuclei ten days from re-grafting.



Cells are simply placed in a natural hanging position in the nucs in center of the cluster.



The cell builder colony crowded with bees.

Swarming

Queens reared under the swarm impulse are usually produced under much better conditions than those of emergency. Bees of the proper age, pollen and nectar are as a rule in abundance; therefore many satisfactory queen cells result. The main objection here is in a good many cases too many cells are produced for complete care of each individual, also these queens are bred from a strain given to swarming and if used, will only increase this undesirable characteristic throughout the apiary.

Superseding

Here we find the most desirable condition of the three categories. As in



Mating nucs should consist of sufficient bees with adequate stores to complete incubation of cell and properly care for virgin queens.

the above, nurse bees and bees of wax producing age are in abundance. Nectar and pollen are coming in freely from the field, there is no excitement of the colony, such as in the above two cases. Furthermore, only a very few cells are produced, larvae abundantly fed from hatching to sealing, resulting in giant queen cells half filled with surplus jelly. The resulting queen as a rule is very large, a top brood producer and her colony not given to excessive swarming. If we are agreed, that supersedure queens are of superior quality, then it is only natural for us to assume our queen rearing methods should parallel as nearly as possible those used by the bees in normal supersedure procedure.

The following queen rearing methods are based on the experience of 20 years of breeder queen production. Cull queen cells, and queens that must be destroyed, are an added expense to operations. Under the methods here described, providing rearing conditions are satisfactory, few if any culls will occur.

It is also my opinion, any larvae intended to become a queen must never lack an abundance of suitable royal jelly, even for one half hour from the time of emergence from the egg, until the queen cell is capped over. Other conditions being satisfactory, the quality of the new queen is entirely dependent on the above critical period of her development.

Let us deal first with the cell builder, the colony intended to receive started cells for completion. I prefer queen right finishers. These should consist of at least two Langstroth hive bodies crowded with bees, a very large proportion of which are from seven to 30 days of age. There should be at least 13 or 14 frames of brood of all ages, plenty of pollen and open honey.

In preparing these to receive cells, the queen is confined to the bottom chamber by means of a queen excluder, being given as much capped and older unsealed brood as possible, the very young larvae being

retained for the upper chamber where the cells are to be produced.

The upper brood chamber should have frames of unsealed honey and surplus pollen to the outsides. The center, being reserved for the frame of cells, should have a frame of pollen and nectar on one side of it and a frame of very young larvae on the other. Any other frames containing young larvae may be placed on either side of the pollen and larvae adjacent to the queen cells. The purpose of the above arrangement is to keep a very high concentration of nurse bees in the vicinity of the cells, older bees will remain in the bottom on the capped brood with the queen.

For best results, each builder should not be given over 20 cells to finish at one time. New cells may be given every four days at which time the previous graft will either be capped, or at least finished with the feeding period and may be moved over toward one side of the cell chamber. At least one frame should be placed between these older queen cells and the new graft.

Every time a new graft is given, the builder must be re-arranged as described above, in order to maintain the nurse bees in the area. Be sure to destroy any wild cells started at this time on given frames of larvae.

There must be fresh nectar and pollen coming in from the field. Should nectar not be available, some method of feeding must be undertaken. Never use sugar syrup, if at all possible, rather use feed honey diluted one third with water. Sugar syrup will not rear the quality of queen produced on honey. If for any reason a cell builder's population of young bees declines, the addition of young bees or capped brood must be supplied from other colonies. If feeding is necessary, it should be commenced about three days prior to being given a graft of cells. A cell builder should readily accept cells from two to 24 hours after being prepared.

The Starter Colony

I prefer to use these for giving fresh grafted cells, although under ideal conditions the cell builder may be used for both starting and finishing.

Special boxes for this operation should be made as follows:

A box suitable to hold five frames with coarse hardware cloth nailed over the bottom. A bee-tight lid is made of the same material. This hive has no entrance. These should be arranged with a space in the center left for the cell frame. On one side of the space have a frame of open honey, the other a frame of pollen. The lid is removed, three or four pounds of young bees are shaken from the brood frames of a strong colony into this box and the lid replaced. At this time of making, a fairly liberal sprinkling with the honey diluted with water should be given. An hour later newly grafted cells may be supplied, another lighter sprinkling repeated. The main reason for these feedings is to keep the bees heavily fed and quiet on the frames, otherwise many bees would be lost each time the lid is lifted through flying. During use these starters should be kept in good shade, if warm. A dark building, if kept cool is quite satisfactory. Three bars of cells, or 60 cells, may be given. Upon removal of cells 24 hours later, these bees should be shaken out at the entrance of their home colony, allowing them to return to their former duties. A new lot of bees must be used for each graft.

Preparation of Grafting Larvae

If desirable, grafting larvae are not needed on a daily basis, the following method will give satisfactory results.

An empty, dark brood frame, previously polished by the bees and ready for the queen, is placed in the center of your breeder queen's brood nest. Twenty-four hours later this frame should contain sufficient eggs to supply plenty of grafting larvae. A nuc, or feeder colony similar to

the one used for starting cells should be prepared on the second or third day after the frame was given the breeder queen, making sure once more to place open honey and pollen on each side of the space for your frame of eggs. These bees are given no other brood. They should be fed as described above. Being mainly nurse bees and queenless they are anxious to feed the newly hatched larvae. On the fourth day from giving the frame to the breeder queen, it should contain larvae from 12 to 24 hours of age, fed to the extent where it is all but floated out of the cell.

A small building equipped with an overhead fluorescent desk light, with some control of heat and humidity is ideal but not absolutely necessary. Temperature of about 80 degrees accompanied by a very high humidity are desirable. The high humidity prevents the larvae and royal jelly from drying out during grafting operations. Water may be scattered on the floor, damp cloths hung in the room, or better still a pan of water placed on an electric hot plate and kept at boiling temperature.

Grafting may also be done outside. Sunlight, being a perfect source of light, should not be allowed to shine directly into the cells containing larvae.

Artificial queen cells may either be purchased or made by the queen breeder. Where only a few are needed, they can be cut from brood frames during normal colony manipulation. These dark queen cups are very acceptable to the bees, can easily be attached to the cell bars by simply pressing the ledge of surplus wax along their edge with your fingers. Regardless of cells used, it is desirable to place the cell bars with cells attached in a strong colony for an hour or two before being used. This allows bees to polish the floor and walls, also to thin the edges ready for drawing and secure the cell to the bar. The manufacture of homemade queen cells will not be dealt with here because of space required.

Having everything in readiness, let us proceed to graft and finish our first frame of cells.

The larvae used or the colony it comes from is of little significance for our initial graft, as its sole purpose is to have our queen cells started and well supplied with royal jelly. Larvae of 24 to 30 hours of age is desirable for this purpose, being easily handled, also quite acceptable to the nurse bees in our started colony.

Having selected our frame of larvae, place it with the top bar toward you, tilted sufficiently to allow larvae to be viewed with ease. Adjustment will also have to be made for light.

Removal of larvae from natural cell to queen cup is not too difficult, but requires practice to attain speed and accuracy. The grafting needle (either steel or wood) is simply slid down the side of the cell, either

to the side or back of the larva until below the level of the larva resting on its bed of jelly. By easing needle tip under the larva it can be lifted from its original position and placed directly in the bottom of the queen cup by pressing the needle tip lightly into the wax, withdrawing the needle from under the larva, leaving it with adhering jelly in desired position.

Grafting must be carried out as rapidly as skill permits; newly grafted cells should be placed in starter colonies as quickly as possible; the number grafted before giving to the starter will of course depend on speed of operation. Having placed the cells in the starter, give the light feeding described earlier, place in selected location for 24 hours, avoiding any further disturbance.

The following day should find our cell builder in readiness to receive its quota of 20 started cells, or less. We should also have previously carried out the steps necessary to have our frame of grafting larvae of 12-24 hours of age.

We must remove our grafting larvae from the nurse colony, brush the adhering bees from it with a soft bee brush. Never at any time shake bees from grafting larvae or queen cells. Also, we remove our frame of started cells from the starter, remove bees by brushing and take to the scene of operations, being careful not to jar or injure the cells which are very tender at this stage.

We are now about to undertake the most critical operation in our attempt to rear queens of superior quality. This is known as double grafting, which consists of removing the original larvae from our started queen cells and replacing with the younger heavily fed larvae from our chosen breeder. Special care must be exercised in order to avoid disturbance, or change the consistency of the jelly in the started cells. Should the above occur, the nurse bees will in all probability, remove all jelly from the cell then start feeding the new larvae over again, thus eliminating the advantages of double grafting. If it is found necessary to rip the side of the cell slightly in order to remove original larvae, little if any damage will result, providing it is not over-done. I prefer larvae about 24 hours of age for my first graft. It is surprising the amount of growth at this stage in the 24 hour period. The larger the larvae, the more difficult to avoid dragging jelly up the side of the cell during removal.

For removal of larvae a pair of medical tweezers, with long slim points and off-set handle are ideal.

Taking the bar of started cells in one hand, we remove the old larvae as rapidly as our skill permits. Once completed we simply re-graft with the chosen larvae, taking care to float them carefully on the large bed of jelly without submerging or causing further disturbance to the jelly. This entire operation should be completed

as rapidly as possible and re-grafted cells placed in prepared cell builder at once. Having completed the foregoing operations successfully, there is little more we can do to assure high quality queen cells except to continue feeding of cell builder; if necessary.

These queen cells are ready for removal from builder and distribution to mating nuclei ten days from re-grafting.

In my own operations I use larvae under 12 hours of age where possible. These cells do not hatch until the morning of the 12th day; however there is always the chance of having used older larvae and the ten day timing should be used as a starting practice. Cells are removed from builder on the morning of the 11th day in my own operations.

In all handling of cells, care must be taken to avoid chilling or jarring. Lay the cell bar on its side, remove cells carefully, cutting from bar, keeping knife as close as possible to the surface of the bar. Never place cells with tips pointing upward, or in an upside down position for fear of injuring the legs and wings of the unhatched virgin.

After removal, cells may be carefully placed in a container having a soft cotton batting floor; cells may also be covered with same during transportation.

Mating nucs should consist of sufficient bees with adequate stores to complete incubation of cell and properly care for virgin queen. Personally, I prefer a mating nuc containing some brood. Not only does this give the nuc a feeling of security, it greatly lessens the chance of bees absconding, also gives better balance of nurse bees when young queen commences to lay. However, nucs may be started by shaking sufficient bees into them, secured from populous hives. Should this be done it will be found necessary to confine bees to nuc until virgin hatches. Cells are simply placed in a natural hanging position in center of cluster. Press base of cell into comb sufficiently to hold in place, bees will soon secure properly.

It will be found advantageous to check each nuc on the second day after cells were given. Take time to locate each virgin, inspect for deformed wings and legs. This is also an excellent chance to remove the empty queen cell and inspect for amount of surplus jelly remaining in cell. Cell should still contain close to one-half inch of white soft jelly. This is your best evidence of the pupa having an abundance of food during its final stage of growth. Any cell containing only a residue of brown solid jelly is not desirable. Occasionally, a cell will be found with no jelly at all. I would view this virgin with suspicion; in all probability this larva had all jelly removed as described at the time of re-graft.

(Continued on page 257)

Siftings

By CHARLES MRAZ
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MARCH 21st, the first day of spring. Here in Vermont it is a beautiful day, sunny and if you get out of the cold, northwest wind it is almost warm. The bees are having their first real flights of the winter since last October. Mid-day it is about 50°F. in the shade, a temperature that all beekeepers should remember. Above 50°F. bees will fly, below 50°F., they will stay inside and keep quiet. Or at least they should if they know what is good for them. By using this temperature as a guide, the beekeeper can be certain when bees will be flying.

After a rather cold winter much of the time below freezing, with quite a few days down to -30°F., the big question is, "How are the bees wintering?" Last fall, with a better honey crop, bees went into the winter fairly heavy with honey. We have not fed sugar syrup for winter for the past 30 years or so. We leave supers of honey on the bees instead, for two good reasons. It is less labor, hence cheaper to leave honey than feed sugar syrup and the bees come through the winter much stronger.

A year ago last summer the honey crop was short and we had our largest winter loss in years although temperatures were not as cold as this winter. We just checked several yards today and find one yard with none dead. Another yard had 3 dead out of about 40 colonies. So it looks like bees wintered well this year in spite of colder winter weather. I firmly believe a strong colony with lots of honey and plenty of ventilation will winter well no matter how cold it is. Moisture in winter kills bees, not cold. But it is also true, the colder it is the more moisture condenses in the hives. Therefore, the colder it is the more ventilation bees need for the winter. To many beekeepers this doesn't make sense at all. It took me many years to learn this simple fact. The sooner you learn it, those of you in cold climates, the better luck you will have wintering.

If we have a good spring and bees have all wintered well it will mean we will do lots of dividing this year to prevent swarming, and to replace queens. In the February, 1979 *Gleanings* Grant Morse speaks about the problems of the commercial beekeeper. There are two operations that we have used in our commercial operation for quite a few years that I believe help solve some of the most important problems. They are, control swarming and raise new queens. Dr. Morse speaks of beekeepers working at cross purposes with nature to control swarming and securing new queens. Long ago I learned you cannot work at cross

purposes with Nature, especially in beekeeping. These two operations that we do I feel are working with Nature and the bees, not against them. First is the matter of reversing the hives in the spring as soon as it is warm enough, sometimes before dandelion bloom. It is the nature of bees to work up in a hive, they hate to work down into empty hive bodies. So, I believe one way to help this "nature" of the bees is to put the brood down on the bottom board where it belongs and where the bees normally have it, and the empty bodies that were on the bottom, put them on top so the bees can work up into it as is their nature.

Also, at the same time, it makes it easy to check through these empty hive bodies on the bottom of the hives to remove broken combs, combs full of drone cells, old, heavy accumulations of propolis, clean the debris from the bottom boards, fix the foundations of the hives, etc. Many of these important things can be done at the same time. At this time of the year, the beekeeper has the time to do these important "chores".

When honey is left on the hives for winter feed, the normal hive that is wintered over is usually two standard hive bodies and one or two shallow supers with honey. As soon as danger of freezing weather is over many of these two and a half story hives will be filled with bees and brood down to the bottom board, one month before the main honey flow. At this stage of the game, it is natural for bees to swarm.

For years we used to fight this natural instinct of the bees to swarm by trying to prevent it with every trick in the book and with every trick we could dream up at night. We tried to breed "non-swarming" bees, cut out queen cells religiously every 8 days, give them lots of super room and mix up full combs with empty combs. You name it and we tried them all for many years. Then it finally dawned on me, "You darn fool, if the bees want to swarm, help them swarm." And that is what we do.

With two people running a thousand colonies, we have learned to avoid doing two things, looking for queens and handling frames. Making divisions by looking for queens and handling frames takes much too much time besides upsetting the yard of bees and may start robbing. That is why we like two hive bodies for wintering. In the spring when we divide or "swarm" these strong hives, we simply remove one whole hive body. We never touch the individual frame.

We simply take away the hive body with the most bees and brood to a new location or place it on top of the parent hive over a nuc board (a double screened inner cover). The hive body that may have less brood is left on the old location on the bottom board. An empty hive body is placed on top of this and any supers of honey and bees go on top of the

empty hive body. That's all there is to it. It takes just 5 minutes to divide a hive or "swarm" it. The only thing different in this operation and natural swarming is that we do it before the bees get to it and the "swarms" end up on our bee yard rather than up in a tree somewhere.

As far as I can see this method of "swarming" satisfied the bees' swarming instincts as does natural swarming. Also, we do like to keep the old queen in the old location, as this is the hive that will make the honey crop. Since we did not look for the queen when we made the divisions, how do we find her without looking for her? Easy, just look into the division you made from the parent hive, 4 days after making the division. If you see queen cells started, the queen is in the old location. If the old queen is in the new division, simply change hive bodies, putting the hive body with the queen back to the old location.

We let every division, as a rule, raise their own queens. The main reason is that we want to perpetuate our best northern stock, bees that we know winter well and come through the winter strong. If you raise daughters from your best queens and perpetuate them, that is Nature's way of natural selection of queens that have lived in the area for many generations.

This does not mean you should never buy laying queens. Of course they should be used when necessary to introduce new blood or to build up fast for honey production. However, for your foundation stock, follow Mother Nature's law, "swarm" the bees by dividing them and let each "swarm" raise their own queens. I know some beekeepers will say, such divisions cannot raise good queens. Nonsense. Strong divisions can raise good queens. If a division is not strong enough to raise its own queens, then you have no business dividing it.

FLETCHER THE 4-H'ER



"YOU'RE OVER-REACTING, FREDDIE... I SEE I HAVE A LOT OF TEACHING TO DO ABOUT BEES TO YOU!"

BEE TALK-----



By **DR. RICHARD TAYLOR**
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I WENT BACK to my little island this month, the one I described here about a year ago, and found everything much the same, except there were more people coming and going. It is an unspoiled little island, but in a few years the tourists will have destroyed the charm that brought them there to begin with. I heard that a golf course is being built. That is the beginning. Anyway, I looked up my friend Ms. Foot, the beekeeper who lives high up the mountainside overlooking several hundred square miles of the Caribbean, and who tends one hive of bees, along with her chickens and garden. She had harvested over two gallons of lovely honey since my last visit, of which I now have a small jar to treasure. I can pass along from her the information, which I tested, that dried banana leaves are hard to beat for smoker fuel. I also learned on this visit that there are at least three beekeepers on the island, for I met the third, an Englishman who, with two colonies, seems to be the island's biggest beekeeper.

I love that little island. I don't do much there, except dabble around, swim, watch the pelicans dive for fish, and enjoy my favorite little rundown hotel of four rooms, rarely fully occupied. I chased three rats out the first night, then they were content to leave the place to me. They were nice rats (I was told), the kind that live in palm trees. I leave my camera at home, watch the people come and go, and speculate on what makes them act the way they do. I have a pretty good theory about that.

Back home, the crocuses were just beginning to poke up. I planted three hundred around my honey stand last fall. My first visits to my bee yards, on a couple of warm March days, revived the annual excitement of spring. All the colonies came through, most of them very strong and as heavy as lead, so I'm going to have to split them up and sell some off. Of course, I found myself talking to the bees again, which I've missed doing these several months. Don't let anyone ever tell you that it does no good to talk to your

bees. It does me a lot of good, muttering away to them. Of course, they don't know me from Adam, but these one-way conversations nevertheless establish some sort of kinship, I have no doubt. Things go better if you talk to them a bit, same as you would a dog or a horse or anything else.

Which reminds me of something quite irrelevant to all this, namely, that things also go better if you do lots of whistling. I don't mean in the bee yard; I mean, everywhere. There seems to be no laws against it, and even if it attracts a bit of attention sometimes, it is at least harmless. Of course, you don't want to whistle in church or similar places of solemn doing, but it is astonishing all the places you can whistle away, as loud as you wish, without anyone paying much attention. My friend at the post office once told me how she used to love to whistle, so I asked her why she ever stopped. She didn't know.

So I think I'll go on whistling, and talking to my bees, until it is time to go to my grave. I could do worse.

Now back to the subject of bees. Here is something I've been wanting to bring up for quite awhile. Namely, the idea of collecting honey samples from all over. There are so many honeys, and so much variety in them, that it is a temptation to start a collection—the way some people collect old bee smokers or (like me) old bee books. But I've resisted this temptation to collect honey samples. Mainly because most honeys granulate sooner or later, the jars get dusty, and more important, what good is it to have a collection of honeys unless you can offer people tastes? But if you are constantly sampling them, then slow but sure, there goes your collection.

Well, I found the answer to this last summer, when a graduate student at Cornell gave a lecture on honey plants, with colored slides and, just as important, sample jars of the honeys from the honey plants he was showing on the screen. He would show the audience a slide or two, then on would go the lights and around would go the jar of honey, with little wooden sticks to sample with. I never saw such interest in a bee lecture in my life. Most of the people had no idea there were all these different kinds of honey. All wanted to know where they could get them. So it not only stimulated great interest, it also made, at a stroke, a lot of appreciative honey users.

When we beekeepers get invited out to give talks to lay people, we naturally assume that nothing could be more interesting to them than bees, since it is what interests us so much. But it is surprising how many people have no

interest in bees at all, beyond asking the same tiresome questions about "killer bees" and that sort of thing. Everyone, however, is interested in eating, and when people learn that there are all sorts of different kinds of honey, all delicious, then their ears pick right up, and you've got a good audience.

So you might try that. I think I'm going to. I already, last fall, got a few pictures of fall flowers—a field of sunflowers, goldenrod, and so on, to start my collection of slides. Now I'll have to pick up the honey samples to go with them, and when I get asked to talk somewhere, I'll have it made. If any readers want to send me samples of interesting honeys from plants that don't grow around here, along with corresponding slides, then I'll reciprocate with a sample and slide of buckwheat honey. But drop me a note first—that's very important. I don't want to be deluged. It seems like a good idea to me, one on which beekeepers from different regions can cooperate in a way that puts a bit of zest in things, and besides that, make for excellent publicity for honey.



Melisa Ann Ratliff. Photo by Hoover Studios.

OHIO STATE HONEY QUEEN

MELISA ANN RATLIFF from Miami County was crowned Ohio State Honey Queen at Capital University in Columbus, Ohio on the 10th of March.

Mr. & Mrs. Joe Copeland of Covington, Ohio, the founders of the Miami County Beekeepers Club, co-sponsored her.

Miss Ratliff will promote honey and beekeeping by giving presentations and speeches at various clubs in Ohio. As queen, Melisa will spend 3 days at the Lebanon Honey Festival and 6 days at the State Fair.

She will represent the State of Ohio at the American Honey Queen contest in Dearborn, Michigan, at the American Beekeepers Federation Convention.

A beekeeper, she is the daughter of Mr. & Mrs. James B. Ratliff, Troy, Ohio.

From the West



By **CHARLES J. KOOVER**
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GOING MY WAY?

HOBBIES ARE fine. In fact every man needs a hobby to counteract the stresses and boredom of his daily tasks. But they should not get out of bounds and cause financial hardships on his family, which they are apt to do. I know what I am talking about although my hobbies, like keeping chickens and bees, always paid for themselves. The chickens, 50 laying hens paid me ten dollars each in clear profit each year. Not counting the labor involved. But chickens need constant care, whereas bees you can forget about for weeks on end. Given a good year my bees did far better than the chickens ever did. But bees need considerable equipment and it can be costly unless you will do it my way.

Start small and don't expect to make a killing the first year. You won't. Two hives and no more. And start with a couple of swarms. One hive is not enough. With two they can help each other out. For instance, when one hive becomes hopelessly queenless the other one can straighten things out with a frame of open brood and day-old eggs. For they can raise themselves a queen again. Oh yes, you can order another from a queen breeder. Leave that to the commercial beekeepers. Don't try to imitate them. Their operations are based on making a living. Yours is for pleasure and relaxation. Keep it that way. As times goes on and you have gained experience it will be time enough to consider whether to expand or not. Making a living from bees is rough, for like the farmer, you will depend on the elements, and they can be cruel to your bees.

So then, here you are. Two hives established from swarms. This first year you can forget about swarming, not entirely though. Don't let them become crowded in the brood nest or out they go.

After you get your bees established in a single brood nest with eleven deep frames

spaced 1/4 inch apart, order a couple of queen excluders as described last month. Also order or buy from your nearby beekeeping supply dealer, four 6-5/8 inch supers. They are popularly known as Illinois supers. Make sure that they have metal rabbet strips to be nailed on to keep the end bars a 1/4 inch above the end bar rests. For shallow supers will see you through the first year. That way you are not taxing the family budget too much. I am speaking from experience. Assemble the supers and use "Elmers" glue, for it sticks like a demon. You can also use thin nails but the glue is really doing the work. After the glue has set which takes only a half hour, snap in the molded plastic foundation. I will tell you further on why molded plastic foundation.

When the bees have nearly filled the first super and have sealed the combs, put on the second super. I should have told you to put the queen excluder on top of the brood nest to keep the queen out of the honey supers. When they are doing well in the second super reverse the top super with the one below it. The inner cover of the hive has a slot in it to put a "Porter" bee escape in it. Put it between the first and second super. The bees will escape themselves out of the filled top super and go to work on the super below

My friend Harris scraping the sealed comb off the molded plastic midrib foundation.



it. If you put the bee escape board on near the week-end, come Saturday you can extract your honey. Take off the full super towards noon while the honey is warm and scrape off the filled combs with a wide putty knife. It only takes a half hour and you should put the wet combs back on the hive but first take off the bee escape board. Everything is held down to a minimum expense. The inner cover serves as a bee escape board for one day.

So here you are. Your bees have paid you back and you are paying your family with honey for the money you invested in bee equipment. You may even have some honey to sell which your kids will gladly peddle all over the neighborhood. Don't give any honey away except to the neighbors to repay them for their patience. Don't give honey to friends. They will think you owe it to them. It's dynamite, instead sell it to strangers. They will gladly pay a fair price if the flavor is good. So far so good. But how did you strain the honey out of those broken combs? Easy. Get yourself a couple of five gallon buckets from a baker. He receives his frozen eggs and other baking supplies in them and they are not returnable so he will let you have them for free or sell them at a small cost to you. Cut a hole in the bottom of one of them to let the honey out. The other one is nested under the one with the hole to receive the strained honey.

Put a new washed and damp diaper over the top bucket and let it bag in the bucket. It must be damp or the honey won't strain through it. Tie a string around the top of the can to prevent the strainer cloth from sagging into the bucket. I am spelling out every move you make to make sure there are no hitches. We all were beginners once.

With a wide bladed putty knife scrape off the sealed honey comb from the molded plastic foundation. Do both sides of the comb. You don't have to be careful for the molded plastic foundation can take it. You can let the uncapped frames drain in an empty bucket before replacing them in their super. It's amazing what you can find around the house without having to go out and buy it.

Next, put the whole she-bang, the two buckets fitted on top of one another, out in the sun covered with a plastic garbage bag. The dark ones you put the yard rubbish in. Put some weights on the overlap on the ground so the bees can't get in and start robbing. You got to think of everything. It's amazing how fast the honey will get out of the broken combs. But don't let the wax melt for it really gets hot under that plastic bag and it will ruin your diaper strainer cloth for good. When you get all the honey out, wash the cappings and let them dry. They are worth a lot of money these days. Clean everything up and don't leave a sticky mess or you will hear about it. A few days

(Continued on page 261)

GLEANINGS IN BEE CULTURE



More Sunflowers in New York State

SEED SALES indicate sunflower acreage in New York State could increase from about 4,000 acres in 1978 to 8,000-10,000 acres in 1979. Yields last year were such that growing sunflowers was as profitable as growing corn. Last year's crop was shipped out-of-state for processing and oil manufacture.

A group of New York growers is investigating building an oil extraction plant in the state; the plant could process sunflowers, soybeans and rapeseed. At present, New York does not grow enough of these plants to meet the proposed plant's needs and it would be necessary to bring in seed, especially from Ohio. Such a processing plant might revive interest in rape production in the Champlain Valley of New York and Vermont, and perhaps in Quebec.

Professor Wayne Knapp of Cornell University told me his department (Agronomy) would be increasing research on sunflowers. Sunflowers, soybeans and rape are all known to be excellent honey plants in some parts of the country.

Can Scout Bees Indicate The Height Of A Food Source?

Professor Karl von Frisch and his students researched many aspects of the honeybee dance language, including asking the question whether scouts can indicate height. In one experiment scouts were trained to a food source directly under a high bridge. This was done by training the scouts to the food which was slowly moved down the side of a deep gorge to a point under the bridge. In another experiment scouts were trained to food on top of a high water tower. In both cases the dancing scouts could indicate the correct distance but apparently they could not tell the recruits to fly "up" or "down" and the food was not found.

New data suggests that while honeybees may not be able to communicate information about the heights tested by von Frisch, they may be able to indicate lesser ones. It is not illogical for them to do so. The authors of the paper cited below point out that insects which may live and forage at different heights have need to

Research Review



By **DR. ROGER A. MORSE**
Research Editor of *Gleanings*
Professor Apiculture
Cornell University, Ithaca, N.Y.

tell their nestmates this kind of information.

This new data was gleaned by training scouts from the same hive to two feeding stations, one at ground level and the other about six yards above the first. It was observed that the scouts remained the same at each food source. More important, those bees which were recruited went to the same food source visited by the scout.

When the two feeding dishes were brought together slowly, and then interchanged, the bees followed their own dish only to the point where the two were brought together. Thereafter, most of the bees followed the wrong dish back to the point to which they had been trained originally.

These data provide us with information that honeybees can convey information in three dimensions; the earlier research by von Frisch shows there are limits in what information may be conveyed. It appears that bees can give good information about the height of food sources within the limits of the trees and fields where they normally fly and forage.

Wellington, W.G. and D. Cmiralova
Communication of height by foraging honeybees, *Apis mellifera ligustica* (Hymenoptera, Apidae). *Annals of the Entomological Society of America* 72: 167-170. 1979.

Less Insecticide On Alfalfa In The East

Cornell University Professor George Gyrisco, who has spent over thirty years studying the control of forage crop insects in New York State, told me recently there would be little insecticide used on alfalfa grown for hay in the Northeast this year. Alfalfa is a major honey plant in late July and August in many parts of the

Northeast. It yields the greatest quantity of nectar when the weather is hot and dry.

The alfalfa weevil, alfalfa leafminer, and leafhoppers (particularly the potato leafhopper) often ravage alfalfa. Changes in strategies for control of these pests have reduced the need for insecticide applications on this crop.

The introduction of parasites in the 1960's has controlled alfalfa weevil under most circumstances. One still finds the occasional field which is damaged, but so rarely that control with insecticides is not warranted. As recently as five years ago, however, beekeepers in the Northeast were suffering losses as a result of some growers spraying alfalfa in bloom.

Evidence of leafminer activity is readily seen, and the harm done by these insects is therefore often overestimated. However, leafminers have been studied closely in both Vermont and New York. No one has yet demonstrated that the loss is of economic concern, even when the damage looks severe.

Leafhoppers do not overwinter in the northern states. They first arrive in New York State from the Gulf States in June, carried north in the atmosphere by the jet stream. They thrive during hot, dry summers; this is the same kind of weather which encourages alfalfa to yield nectar.

The biggest factor in the beekeeper's favor is that dairy farmers worry about contaminating their milk with pesticides. Milk is monitored quite closely in this regard. In many parts of the Northeast our best apiaries are located in the vicinity of dairy farms. Insofar as freedom from pesticides is concerned, 1979 looks like a good year in these areas.

Book Review

Bees Don't Get Arthritis, Fred Malone, 174 pages, hardback, \$8.95, E.P. Dutton, 2 Park Ave., New York, N.Y. 10016.

Fred Malone set out on a 32,000 mile odyssey looking for scientific evidence and personal reports to support the claim of the curative value of bee stings.

His findings are documented in this book with an introduction by George Vogel, M.D.

The best source of information, the author found, was from the individuals who have experienced bee sting therapy.

Bees Don't Get Arthritis perhaps may not change the views of the medical profession in regard to the merits of using bee products for therapy but it is a long trip and a lot of beekeepers the author met during his travels will find their name in the book.

Fundamentals for All

"EVERYONE WANTS A PIECE OF EARTH"

AS BEEKEEPERS, we are most privileged. We have to get out into the open air to work with our bees. We are away from the telephone, radio, television, newspapers, magazines, cluttered desks, and all the attention-getting devices that clutter up our lives. For a beekeeper who knows what he is doing, beekeeping is a game enjoyed in the playing, as well as in the reward for winning. The commercial beekeeper, who lives with his bees all the time, may not appreciate his position, or consider it enviable, but to the desk-bound executive, or the machine-bound factory worker, beekeeping is an elixir that relaxes and refreshes and helps to give life more meaning.

There is an urge within everyone to "get into the picture" by being a participant with Nature. It is evident in children at play. They will leave their swings and slides and adult-designed contraptions to dig in the earth, loosening it with a sharpened stick, or an old spoon, and making castles with their hands. As adults, we allow "the call to produce" to crowd out the elemental necessities of wholesome living. If dame fortune smiles on man's productive effort as he spends his time unresponsive to the primitive urge to engage in working with the soil, he may buy a farm and may, vicariously, enjoy natural production. But for those who cannot afford such amenities, there is still the opportunity to get out and enjoy it. Without owning property, beekeepers can harvest a crop from it.

Those who can afford farmland are becoming fewer all the time. We are constantly being reminded that the available land is limited. They are not making it any more. And fewer and fewer people can afford acres of real estate. In fact, fewer and fewer people can afford to own homes. In our industrialized society, the average person moves three times during his productive life. If he takes out a twenty-year mortgage on his property each time he moves, he will never even own his home. In fact, there are predictions that farmers, while they may own their farms, may not even own the buildings on them. The barns and homes will be owned by some other "consortium" organization which will rent them to the farmers. At any rate, we are seeing a change in society—the last chapter in the twentieth century edition of a work which tells of the vanishing family farm as many of us know it.

Beekeepers are often looked upon as persons who get something for nothing. They don't even own the land on which



By W. A. STEPHEN
Worthington, Ohio

they set their apiaries often. Their bees make the honey and all the beekeeper has to do is "rob his bees". It is an oversimplified picture, as every beekeeper knows, but the elemental fact is that beekeepers harvest a product from land they do not own. Their bees cannot be restricted in flight over the ten thousand acres surrounding their hives. Throughout the ages, bees have taken whatever Nature had to offer within two, or three miles of their homes and the largesse of Nature's offering determined their survival, or demise.

So it is today. The beekeeper's fortune depends on whatever grows in the area where he sets his apiary. The diversity of trees, shrubs, and plants growing in the area provides whatever forage the bees can find. But the beekeeper doesn't own and has little, or no control over whatever may be growing in that area.

Aside from the profit, or loss, from keeping bees, the beekeeper can enjoy all the benefits of owning tracts of land that enable him to participate with Nature. Everyone has the urge to have a place in

the sun, literally, as well as figuratively. He, or she, wants to own the earth. Well, not the whole earth, but a part of it. With the declining possibility of such possession, beekeepers have the enviable rights, granted to them by the land owner, of getting off the highway, perhaps up a rough lane, to a secluded apiary.

Here, perhaps within sound, but out of sight of the things that cloy man's soul, the beekeeper can enjoy communion with Nature, just as if he owned that piece of earth. The urge to have a piece of earth is satisfied. While "messing with his bees", to use southern expression, everyday cares are forgotten. Muscles, not used in factory, or at a desk, are exercised. Brain cells, immersed in business, are brought into play. The curiosity of childhood is revived and feeling of relief and release enable one to live again in the fresh air and with feet on Mother Earth.

For the executive, upon whose decisions success depends; for the manager who must deal with personal foibles; for the doctor who must prescribe for man's ills; for the surgeon, or dentist, whose efforts must be directed to correcting man's unfortunate, perhaps self-induced malfunctioning parts; for the lawyer concerned with the documental rights and wrongs of society; for the clergyman who seeks to orient man's thinking above mundane existence—for all of these, the participants in stressful occupations, as well as for those whose tasks are less demanding, or are routine and monotonous, for everyone who feels that he must have a piece of earth, beekeeping is a hobby that bestows all the benefits of land ownership. It satisfies the urge to have a piece of earth.

BOUNTIFUL SNOWS

STEPHEN YENCHIK of Bountiful, Utah had not checked his outyard since November and when he walked in, in the middle of January this snowy scene greeted him. The snow was drifted around and had buried the hives in the background. The hives in the foreground are 3 stories high, those at the far end of the row are 2 story.

Stephen says the weather was colder than usual the past winter with heavy snow and winds in December between 75 and 100 m.p.h. The average winter night-time temperature is probably 0-10° above where the bees are located. "I am a firm believer that if your bees are in good shape and well supplied with honey they can make it through the winter", says Stephen.



Front three hives are three stories high and the rest are two stories and buried under the snow.



By BESS CLARKE
Canton, PA.

Notes from the Straw Skep



A UNIQUE vacation spot is the nation's first underwater state park, located at Key Largo, Florida. John Pennkamp Coral Reef State Park, a successful effort to preserve the only living coral reefs in the continental United States, was dedicated in 1960.

The spectacularly beautiful coral reefs and exotic fish are available for viewing by three different methods: snorkeling, scuba diving, and glass bottom boat. There are nine reefs in the park, stretching 21 miles along the Florida coast, south of Miami.

Coral is a living animal called a polyp and it grows by attaching itself onto a base with limestone which it forms from its body. It requires a water temperature at not less than 65°F. to survive. The nearby gulf stream takes care of that problem. The soft outer surface is easily destroyed and the reefs came near to extinction because of the heavy demand by the tourist trade for souvenirs.

We camped on the land based area of the park when we visited Florida in March

and took advantage of all the activities except the scuba diving.

One special treat was a guided canoe trip through the mangrove swamps. Our ranger was enthusiastic, well informed, and had a great sense of humor. He even knew a little about honeybees—smart chap.

A not too pleasant feature, in my opinion, was the constant wind which got heavy at times. Residents assured me that it is better than the mosquitoes or the heat which they have when the wind stops.

The swimming was disappointing, too, at the park headquarters. The beaches were small and stony and the water was clouded. But out in the ocean where we snorkeled it was crystal clear, 72°F., and a delightful experience.

In addition to the coral reef we visited our bees, and some other friends, saw a lot of birds, and gorged ourselves on citrus fruit. It was a really good vacation and we came home to a week of beautiful spring weather which served to extend the holiday feeling.

Since we've come home I have been making desserts which combine honey

and citrus. Have you ever really tried broiled honeyed grapefruit? You loosen the sections of the grapefruit halves, spread them with a spoonful of honey and a dash of cinnamon, dot with butter, and brown under the broiler until heated. Serve at once.

We had a pondorosa lemon which provided enough juice for two lemon pies, a meringue and a chiffon. And we enjoyed an orange pudding, too.

Fresh Orange Pudding: 1/2 cup honey, 2 tablespoons cornstarch, 1 tablespoon grated orange peel, 1/2 cup orange juice, 1 tablespoon lemon juice, 1 egg, 1 tablespoon margarine, 1 orange cut into sections.

Combine honey, cornstarch, orange peel, orange juice, lemon juice in a small pan and cook over low heat, stirring constantly, until the mixture is thick. Separate egg, beat yolk, blend in a little hot mixture, return to pan, and stir two more minutes to cook the egg. Remove from heat, add margarine, and cool.

Fold paste mixture into the stiffly beaten egg white. Serve in dessert dishes with orange sections, or layer in parfait glasses. Makes four small servings.

Questions and Answers

Q. I'm a new beekeeper with 13 hives of bees now and planning to have around 20 to 25 hives.

Do bees accept the plastic foundation and frames or do they reject any and all plastic materials?

I've heard both pros and cons from beekeepers. Is there anywhere that people are experimenting with these new materials?—J.J.V., Oregon.

A. Plastic foundation is being used and in some instances plastic frames as well. You will note from advertisements in the bee journals that the foundation is available from several sources. Acceptance of plastic is apparently satisfactory although some types may be more acceptable than others. No test results have been published to our knowledge in

regard to the relative acceptance or comparing with beeswax foundation with respect to drawing out into comb.

The advantage of plastic foundation is its durability. The disadvantages are its initial cost and the possible reluctance of the bees to draw it into combs where the honey flow is poor, or, colony management is not suited to taking advantage of such specialized beekeeping equipment. We suggest a limited trial before making a choice between plastic foundation and that made with natural wax.

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Q. In the instructions for feeding bees Terramycin in sugar syrup it says that one should "dissolve 1/2 level teaspoon of TM 50 D in a five pound honey jar containing a 1 to 1 syrup of sugar and water".

My question is this; must a five pound container be used? Is that particular mixture necessary? I would like to use 1 to 1 syrup in gallon jars and mix with a teaspoon of Fumadil B and 1/2 teaspoon of TM 50.—J.H.B., Virginia.

A. You may mix the medication in gallon jars by using 1 teaspoon of Terramycin (TM 50 D) in a 1 to 1 sugar-water mixture. The sugar must be thoroughly dissolved. Heat the sugar and water if necessary but allow the syrup to cool before adding the TM 50. Terramycin in sugar syrup tends to lose its effectiveness if exposed to sunlight. It may be better to feed TM 50 in a powdered sugar mixture. Mix one part of TM 50 to twenty parts of powdered sugar. Dust the top bars of the brood frames at the rear of the brood nest with 1 to 2 tablespoons of the medication for the

prevention of brood diseases. Usually three dustings are required at 4-5 day intervals. Do not feed any medication within three weeks of or during the main honey flow to avoid possible contamination of the stored honey.

It may not be advisable to mix Fumidil B with TM 50 as there is some question about their compatibility.

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Q. I winter my colonies in two deep units in southwestern Wisconsin. On about April I reverse the top and bottom hive bodies. Now the top deep will be quite light. Will the top unit be heavy with honey just before the main flow which I think starts about June? Which is considered the food chamber, the top or bottom? Instead of adding a queen cell can I just introduce a new queen to the food chamber or will the food chamber make its own queen without adding a queen cell? I would certainly like to try this—as it sounds easy.

Is it safe to feed sugar syrup in one gallon cans in March if the bees need food? I have been told that this would create too much moisture in the hive. Is this true?

Why do bees cluster under and crawl out of the inner cover hole? They were doing this when I checked the hives on March 3rd. Many times I see them doing this even in summer.—R.S., Wisconsin.

A. It is unlikely that the food chamber of the overwintered colony (which is always the upper unit regardless of how many times the upper and lower stories are reversed) will be filled with honey until the main honey flow is at least well underway, sometimes not until near the end of it. Brood will usually remain in the upper unit until well into the main honey flow or until the hatched bees are replaced by fresh nectar and capped honey. If there is a strong honey flow in the fall this will usually insure that the food chamber will be filled with honey. If there is not a dependable fall honey flow it is necessary to take extra precaution that the food chamber is filled by the end of the summer flow. If sufficient honey is not stored by a colony in the food chamber it may be necessary to transfer combs from the supers or from another producing colony. Some beekeepers confine the queen to the lower unit at the beginning of the main honey flow by a queen excluder, allowing the brood in the upper unit to hatch out and be replaced by incoming honey.

You can, of course, introduce a laying queen to the upper unit after disposing of the old queen but to attempt to raise a queen from cells which you have induced the bees to build in the food chamber prior to or during the honey flow will likely seriously interfere with their storing a crop of honey.

It is perfectly safe to feed sugar syrup in one gallon cans in March. This should not create moisture problems unless there is leakage from a defective seal in the container.

The inner cover hole is often the nearest opening to the cluster and any disturbance made by opening the hive will quickly bring bees, especially guard bees, to this opening. A light puff of smoke will drive the bees back down between the frames.

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Q. I have 13 colonies of bees I plan on moving. They will be moved about 15 miles.

The colonies have 3 and 4 deep brood chambers on them. I would like to know the best time to move them and also how I should handle them while moving them.

I also have some supers of honey which have turned to sugar. I would like to know what I can do with them. Could I put them back on the hives? Will the bees use this up?—H.D., Wisconsin.

A. In most instances colonies three and four hive bodies deep are too heavy to move by hand. We would suggest moving a maximum of two stories unless you engage or have a mechanical loader. In any case fasten the hives securely together and screen the entrances so that no bees escape during the moving. Early spring is the best time of the year to move colonies of bees, in my opinion, but of course it can be done at any time of the year that they are flying if several precautions are taken and they are moved a minimum distance so that the field bees will not return to the old location when they begin foraging from the new location.

Place a screen over the entrance and the inner cover hole late in the evening or early in the morning before moving. If very hot it may be necessary to replace the inner cover with a full screen and leave the outer cover off. Cover any other places where bees may escape.

Commercial beekeepers frequently move bees at night and without screening but I do not recommend this for the beekeeper of limited experience and who handles hives by hand. Escaping bees can be a greater nuisance when crawling at night than when flying in the daylight. Handling heavy hives at night increases the danger of accident to the handlers.

Place supers of honey which have granulated below the brood chambers in the spring. The bees will move the honey into or above the brood area if they can use it, or may even carry it out the entrance, but it will be removed from the combs of the super.

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Q. I would like to know if you could direct me to a reference that would give a

complete discussion of the life history of the wax moth. I think I have seen a large and a smaller moth hanging around my hives. I'm particularly interested in each stage in the development of the moth at "normal" hive temperature.—J.W.K., Texas.

A. Of the moths whose larvae infest combs of honeybees, the most common in the greater portion of the United States is the greater wax moth *Galleria mellonella* (L.). It has a worldwide distribution. The size of the adult moth may vary according to the abundance of food, leading to the belief that two types of moths are present. Although this may be true if the lesser wax moth (*Achroia grisella* (Fabr.)) is also found in your area. The lesser wax moth is not as common as the greater wax moth.

The total life period of the greater wax moth from egg to adult is about 49 days at optimum temperature, longer in cooler temperatures. Eggs may hatch in as few as ten days at high temperatures.

A complete discussion of wax worms and their control is given in the 37th edition of *ABC & XYZ of Bee Culture*, pages 667 to 676.

BEE SPEED LAW

By JOAN LE MIEUX
Longview, WA.

BEES GET the right of way in southern Washington state. Walla Walla county commissioners agreed to set speed limits on roads in an area where roads cross traditional bee paths. Alfalfa seed growers found that speeding cars and trucks were killing their pollinating bees.

The speed restrictions now cut traffic from the usual 50 mph to a bee-saver rate of 20 mph. The speed reductions are only in effect during those months when the bees are trekking across the highways, June and July. Time limits are also set for the bee working hours, 8 A.M. to 8 P.M.

Farmers plan on posting the areas themselves, helping to explain the problem to motorists. Limited police manpower does not allow for a great deal of time to be spent watching for anti-bee speeders.

The \$250 maximum fine, however, might be a bit of a sting to unwary motorists.

It is good to know that farmers who organize can get the message to the general public and through concentrated effort, bees can be sheltered against some of the hazards of modern society.

Swarm Prevention

By DR. ROGER A. MORSE
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THERE IS nothing new about swarm prevention. The methods we will use this summer were developed sixty to ninety years ago. As a result of recent research I can better explain how the process works, but I have no new methods to recommend. I believe we will devise a better system of swarm prevention in the future, but not in the next few years.

The best paper ever written about swarming was composed by the late George S. Demuth. Demuth was with the U.S. Department of Agriculture and later served as editor of *Gleanings in Bee Culture* from 1920 to 1934. The title of his work is *Swarm Control*, USDA Farmers' Bulletin #1198, dated 1921.

When a colony swarms, the old queen and 30 to 70 percent of the bees leave the hive. Sometimes colonies have second and third swarms. Swarming depletes the population. A weak colony cannot gather a surplus of honey. Successful honey producers prevent swarming.

Demuth wrote, "The beekeeper's problem at the beginning of the honey flow is twofold: (1) To prevent a division of the working force of the colonies; (2) To stimulate the storing instinct to the utmost degree throughout the honey flow. A division of the working forces or a subordination of the storing instinct at this time will cause a loss in the crop. Swarming can be prevented in many ways, but great care is necessary to avoid causing a subordination of the storing instinct, thus reducing the crop of honey, because the bees work with less vigor." Demuth was correct in stating that the storing instinct can be subordinated; he did not understand the chemistry of why this is true, but today we do, at least in part.

Congestion, The Cause of Swarming

Demuth said further, "Probably the greatest single factor in the cause of swarming is a congestion of unemployed bees within the brood nest or discomfort in this part of the hive from overheating

and lack of ventilation. Colonies which build a barrier of sealed honey around the brood nest during the spring, thus confining their activities to this limited space, may be inclined to swarm even when there is an abundance of empty comb in other parts of the hive."

Non-swarming Bees

Around the turn of the century many people attempted to produce non-swarming bees through careful selection of stock. Demuth observed that it was difficult to measure their success because men who select carefully, and who know what to look for, are also good beekeepers and may unconsciously modify their management program to reduce swarming. Demuth did not think swarming would be eliminated through breeding alone, and I agree.

Space within the Colony

Factors other than congestion complicate and contribute to swarming. The size of the brood nest is important. Recent research by Dr. Thomas Seeley of Harvard University shows that colonies in trees, which have an average cavity of slightly less than a standard 10-frame Langstroth super, will produce a swarm nine years out of ten. Large hives will not prevent swarming but do swarm less frequently. Research by Dr. Thomas Rinderer of the U.S.D.A. and his associates indicates that increasing the storage space available will stimulate foraging and increase the total crop. The guidelines are clear: super early and give lots of supers!

Space within the hive is likewise important. Dr. C.C. Miller, of comb honey fame, used a bottom board two inches deep. He described it as a box without a top and one end. It provides abundant clustering space under the brood nest. Today most beekeepers use nine frames in their 10-frame supers, both in the brood nest and honey supers, to provide extra clustering space between the comb.

Ventilation

Ventilation in summer is also important. The Miller-type bottom board described above gives a large entrance as well as clustering space. Some beekeepers push one or more storage supers back or forward to give more ventilation. Why ventilation is helpful in swarm prevention is not clear but most beekeepers agree it is.

Shade

Shade is said to be important too. What is really meant is protection from the direct rays of the sun. Providing shade is akin to providing good ventilation. It is interesting that Demuth made no mention of the availability of water as bees may collect large quantities of water to cool a hive. Perhaps he assumed that beekeepers always provide water for their bees.

When Will Swarming Occur?

My students and I kept records of swarming over a six-year period in the Ithaca, New York area. We found that 80 per cent of swarming takes place between May 15 and July 15. About 20 per cent of swarming occurs between August 15 and September 15; there is a definite lull between mid-July and mid-August. Further south, in Maryland, Dr. Dewey Caron kept records on swarming over a two-year period and found that in his area nearly all swarming took place between April 15 and June 15. This information tells us precisely when we must watch for swarming and when swarm prevention measures must be taken in these two areas. Each beekeeper must know the swarming dates for his area before he can successfully prevent swarming.

Demuth's Advice

Demuth summarized as follows: During the swarming season use good worker combs; provide extra space within the brood nest by wide spacing of combs and a deep space below the frames; use

Figure 1. Dots show emergence dates for over 200 swarms taken in the Ithaca, N.Y. area over a six year period, 1971-1977. Almost 80 per cent of swarming takes place between May 15 and July 15 while nearly 20 per cent occurs between August 15 and September 15. This information tells beekeepers in our region when they must undertake swarm prevention. Similar data is available for Maryland but is needed for other parts of the country.



SWARM EMERGENCE DATES, 1971 - 1976

large entrances; provide shade and avoid the direct rays of the sun on hives; avoid having bees store honey around the brood nest so as to slow its expansion; and provide plenty of storage space (add plenty of supers). Demuth put all this together in one long but correct sentence: "To prevent swarming to the greatest extent it is necessary to induce most of the hive workers to leave the brood nest early in their lives to take up work in the supers, so that the bees of the hive are distributed over a large comb surface, which in turn should stimulate the field bees to go to the field in greater numbers."

Swarm Prevention Methods

In our area in New York State, where the first swarms issue about May 15, we start swarm prevention methods during about the first week of May. The most simple method, when colonies are in two supers, is to check periodically between the two for queen cups. When cups appear in numbers, or when one sees eggs in queen cups, it is time to reverse the two supers and add a third and sometimes a fourth super of empty combs. To reverse the supers in a brood nest one takes the top super and places it on the bottom board; the bottom super is placed on top. Reversing breaks up the brood nest and relieves congestion. The top super usually contains more brood than the bottom super. By placing the bottom super on top one gives the colony room into which it may grow.

If one feels the colony is still crowded, a single frame of brood from either super may be lifted and placed in the center of the third super. This is called spreading the brood. It is a very effective way to relieve congestion, especially if an empty comb is put into the middle of what is now the second super to replace the frame of brood that has been moved up. Spreading the brood can be dangerous, as the brood may be killed if the weather turns cold or there are too few bees to keep the brood warm.

It may be necessary to reverse the supers two or three times during the swarming season. Whenever it is done the primary goal is to move the brood down and leave space for the brood nest to grow in an upward direction. Honeybees will not normally expand a brood nest downward.

Beekeepers should learn to manipulate and move supers, not individual frames. It is worthwhile to take brood nests apart to understand how bees arrange them, but in practical beekeeping the brood combs in the super are disturbed as little as possible.

Swarm Control

Swarm prevention is concerned with those steps the beekeeper takes to prevent the construction of queen cells and anything that limits the storing instinct. Swarm control concerns those things a

beekeeper does once he finds queen cells with two- to five-day-old larvae or capped queen cells, and he observes that the storing instinct is already subjugated. Since most of what Demuth wrote was concerned with swarm prevention it is curious that he entitled his bulletin "Swarm Control".

Demuth's advice concerning swarm control was simple. To successfully stop swarming one must create conditions equal to those in the swarm or the colony that has swarmed. There is no other way. Swarm control involves physiological change in the worker bees in the hive and the instinct is not satisfied until the act is completed.

To stop swarming one must do one of three things: remove the queen, remove the brood, or separate the queen from the brood. The first two practices may allow the colony to gather a surplus, but in the long run will weaken the colony. The last is too time-consuming to recommend. (The most effective method of separating

the brood and the queen is to follow the methods outlined by Demaree; the process is called Demareeing. It involves so much time and effort, though it will work, that I just can't write about it in good conscience. Beekeeping should be enjoyable, not hard work, and Demareeing is all hard work!)

If I find a colony with queen cells in an advanced stage (those with larvae two or more days old) I usually give up and split the unit into two, three or more units. Doing so requires little time and, while I lose the immediate honey crop, I figure I will have several units that will be producing colonies the next year.

The moral of the story is simple. One cannot get behind in colony management and produce a big crop of honey. The successful beekeeper is one who spends his time in the apiary taking those steps that prevent swarming. Those who are behind and must exercise swarm control methods cannot count themselves among the successful beekeepers.

My Butterfly Net Swarm "Clincher"

By ROLAND BELL
Fort Worth, TX.

IN THE SPRING of 1978, several articles appeared in the journals about methods and means of capturing swarms of bees. Some proposed foundation in frames in hives; some proposed trap-lid boxes; and others proposed a hoop whereon a sack could be used to capture swarms.

All are good and find usage.

As for me, I find the butterfly net approach the best, and it saves much time and travel, weight and space concerns, and especially the troublesome workability angle required in positioning and transporting.

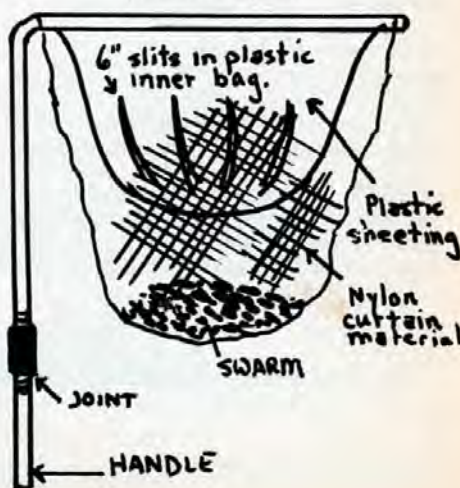
I further am able to improve on the net implement by obtaining a fish net hoop with handle and cut the net off of it, bending the hoop at right angles to the handle. I fashioned a bag of nylon curtain material about four feet long. It is light weight and slick in character and it will not snag so easily as other materials. I can shake one swarm into the bottom of the bag, tie it off, and capture another swarm in the same bag if need arises.

The "clincher", I call it, is a square of flexible plastic sheeting some five feet square placed over the hoop, made to bag into it some 12 inches, and then sewn to the hoop. I used clothespins to help hold the plastic to the hoop until I could sew it

on. Excess is cut off around the rim of the hoop. I then cut slits about 6 inches long in an orange-peel fashion in the center of the plastic that would in effect provide a funnel on the order of a fish trap.

Now this "clincher" really gets them and keeps them in there. I find that I can bump a limb several times without lowering the net to prohibit captured bees from escaping as they used to. Fact is, I can enjoy the work now without getting all tore-up and in a big hurry to lower the

(Continued on page 257)



An Innovative Approach To Extracting

"Using this set-up one man can process about 3,000 lbs. of honey per day."

By **HOWARD CUNNINGHAM**
Parkersburg, W. Va.

ALL OF MY life I have had more involvements than I have had time to pursue. Not wanting to cut any of them out, or more importantly, not wanting to slight any of them, I have always looked for ways to do the job more efficiently. I also believe that all endeavors must be enjoyable and pay their own way.

I started beekeeping in 1950 with 5 hives of bees. During the years that followed until 1970, only comb honey was produced. Examining cut comb honey and extracted honey as to profit and time investment, it was my opinion that extracting was quicker and more profitable. With this in mind, I bought a hand-operated 2-frame reversible extractor. This means of extracting was inefficient for the size of operation I planned.

In 1976, I decided to design an extracting system for 75 to 200 hives which would be quick, efficient, one-man operated, and within a suitable cost range. This system must occupy a relatively small space since it would have to fit into the garage and lower basement of my home.

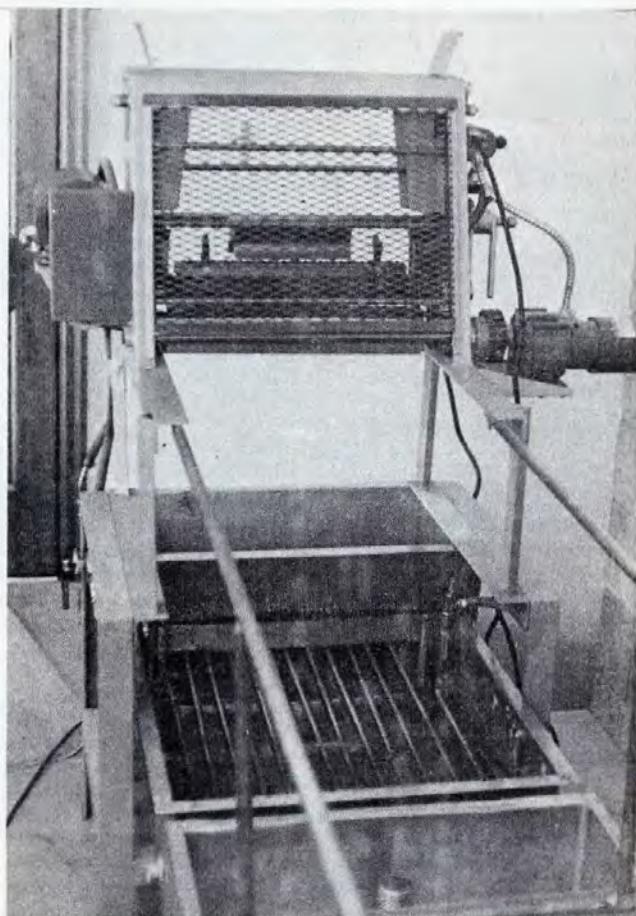
This system would be designed around a radial extractor because of its many advantages. It would provide a larger capacity, eliminate the need for frame reversal, do less damage to combs, and have an automatic speed and time control.

However, the new radial extractor created new problems such as excess cappings, a means of moving a greater volume of honey, a method of warming the honey to remove air and wax particles, a way to hold uncapped combs until extracted, and a faster way of uncapping the combs.

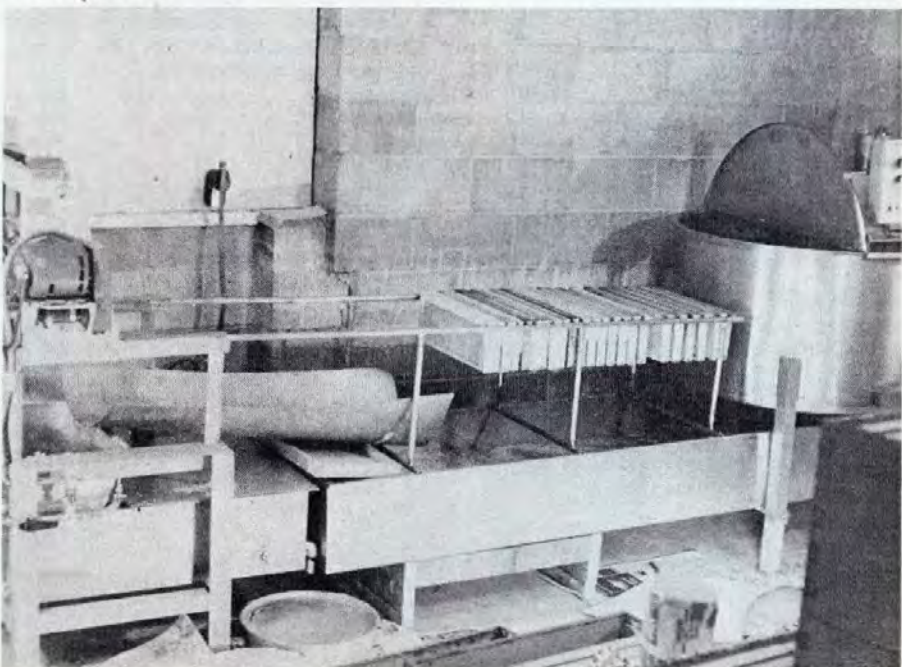
To overcome these problems, the following equipment was chosen, utilizing stainless steel whenever possible. The extractor was a Hubbard 44-frame model. This machine was selected for the heavy gauge stainless steel construction, the bottom middle outlet, legs which set it above the floor, and the automatic speed advance. This arrangement has proven most successful.

Having placed the extractor over an 8-foot clarifying pan, the honey flows from the extractor and is received by the pan which warms and clarifies it. It then

The Cowan minuncapper situated directly above the capping melter. The heating coils of the melter are visible.



This photo shows a sheet of stainless steel which is used to divert the dripping from over the melter to the clarifier. Notice the frames on the holding rack which are convenient to the extractor.



flows by gravity to a lower level, eliminating the need for pumping.

Here the honey is received by 80-gallon Kelley double boilers with electric heating units. These units are arranged in a series so as when one tank is filled, the flow can be switched to the next tank. This tank arrangement is good for separating different quality honeys.

These storage tanks have many other advantages. If the honey should granulate, the heat can be turned on, liquefying the honey without any fuss. Fermentation can be eliminated by warming the honey in these tanks to a temperature of 145 degrees F. for approximately 30 minutes thus killing the honey yeast. Also, when bottling, the heat can be used to reduce the viscosity. This greatly assists in the bottling process. The honey valves are stainless steel ball valves. Two inch stainless steel pipes were used to fabricate 90 degree close ells to which the valves are attached. Larger and cheaper tanks could have been used, but the above advantages would have been lost.

Two knee-length nylons are attached at the end of the honey delivery pipes as it empties into the holding tanks. These are used to catch any large particles which might have passed through the clarifier. Nylon material serves as an excellent final strainer when using warmed honey. These nylons also permit the honey to flow down them reducing air bubbles. Honey

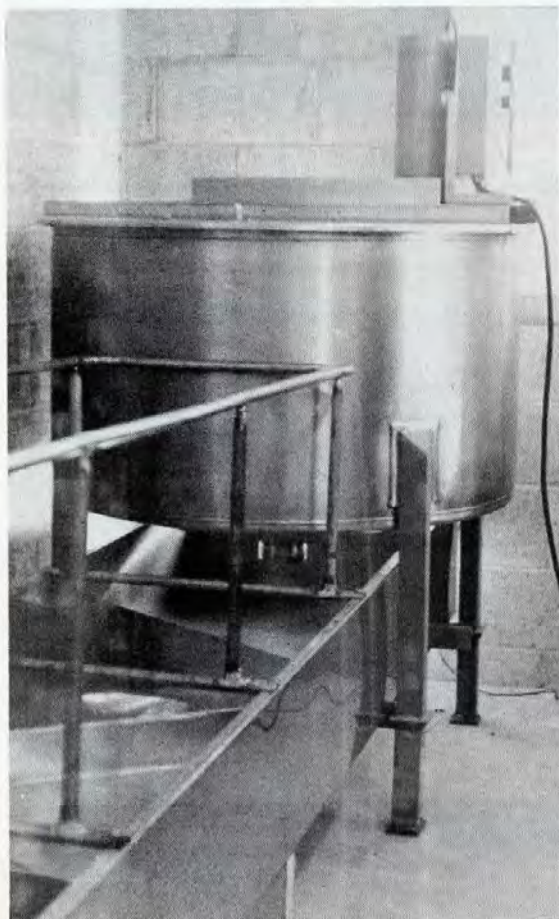


A perspective of the compactness of the basic extracting equipment. A cover is being placed over the coils of the capping melter to increase its efficiency. A pan of wax has just been drawn from the melter, showing the location of the wax outlet.

can be bottled from these tanks at the end of a processing day and this honey will be of excellent quality on which no foam or particles will later form.

For uncapping, a Cowan mini-

uncapper was chosen. This machine will uncap both sides of the frames simultaneously. Its capacity is approximately 6-7 combs per minute which allows you to have another load of uncapped combs before the extractor is ready.



The extractor is placed above the clarifying pan. Also, notice the construction of the frame rack.



A view of the frames in the extractor.



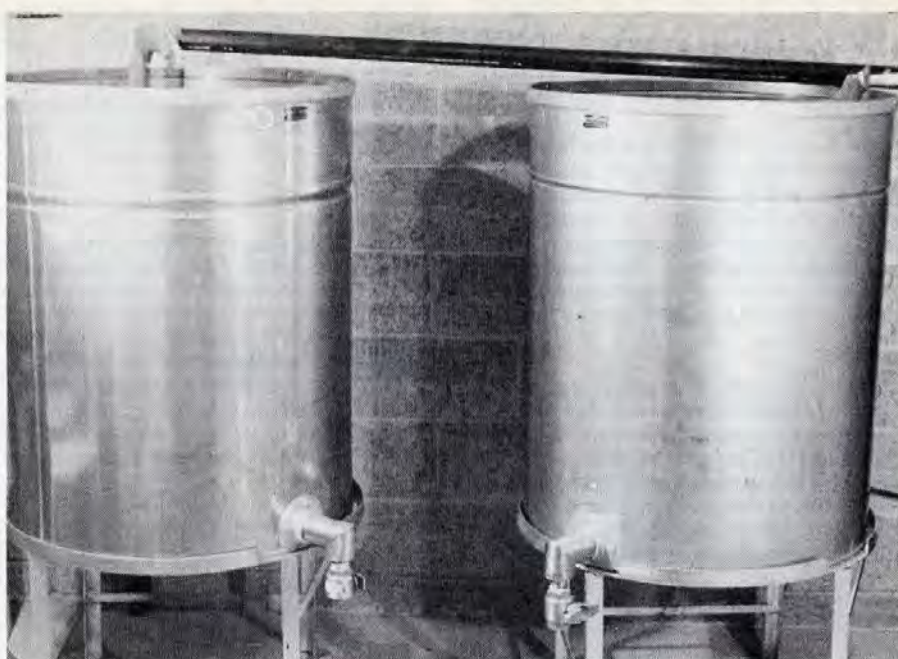
It is placed over an electric heated Waxmaster 500 capping melter. The Waxmaster has a pump that circulates hot water throughout the many feet of coiled pipe. This speeds up the wax melting process.

This combination has worked out fine. The uncapper is hooked into the hot water circulation system of the wax melter. Valves have been placed so that the circulated hot water need not be pumped through the uncapper when not in use. This helps a great deal when you are melting the cappings at the end of the day or when heating up the residual wax in the morning.

There are two outlets from the wax melter. One is a 3/4 inch line to continually carry the honey to a special 80-gallon boiler for capping honey only. This keeps these honeys separate, even though very little or no difference can be detected. The other outlet is for the wax, which can be adjusted to drain off the wax at times of your choosing. This is a very nice convenience.

To combine the uncapping and the extracting system, 1/2 inch stainless steel tubing was used to make a holding rack for the uncapped frames. While the frames are on the holding rack, the heat from the melter and the clarifying tank helps warm the honey in the frames prior to extraction. The honey which drips from these frames fall into the capping melter and clarifying tank where they belong. This rack can accommodate about 60 frames.

A sheet of stainless steel is used to divert the dripping from over the melter



The holding tank on the right receives the honey from the capping melter. The 3/4 inch white pipeline can be seen. The other tank receives the honey from the clarifier. We can see the nylons attached at the end of each line.

to the clarifier. This permits the melter to remain covered which greatly increases its heat-holding capacity. This, of course, increases the efficiency of the melter.

In removing the frames from the extractor, it is convenient to place a super on the holding rack.

The space necessary for this setup is minimal. An area of about 12 feet by 4 feet is required on the upper level and a

storage area of 3 feet by 10 feet on the lower level. This does not include super storage, of course. The supers are stored in the garage for processing and then removed back to the field for clean up.

Using this equipment setup, one man can process about 3,000 lbs. of honey per day. This means that I could process my entire honey crop in about a week and have done a better and quicker job. This frees me for other endeavors.

Some Thoughts On Comb Building

By CLIFFORD BECKWITH
Bean Station, TN.

AS A hobby beekeeper for quite a number of years I kept a few colonies which provided a lot of enjoyment, some honey for home use and a little for sale without adequate equipment or very much in the way of management. One thing which was neglected was the replacement of poor or marginal combs in the brood nests.

As the time came to get more serious about beekeeping a major need was the replacement of poor combs as quickly as possible.

The common procedure is to move the poorer combs to the outside and gradually

replace them with frames with full sheets of foundation. If this is done during a honey flow, the bees will draw the foundation into comb. Doing this on a regular basis will keep poor combs to a minimum.

This plan was followed with varying results. Some good combs resulted and some poor combs replaced. Often, however, the honey flow would weaken or stop before the new foundations were more than partially drawn. With suddenly little to do, the bees would then chew holes in the undrawn foundation. When another honey flow came along, the holes would be filled in with drone cells

resulting in less than perfect combs, which was somewhat frustrating.

There then came to mind an article published in *Gleanings* a few years ago which described the practice used by some Canadian beekeepers of making some of their colonies into "comb builders" prior to killing them off for the winter.

This resulted in a procedure which has been used by me for three years and which may be of interest to anyone having a little time and needing good combs in a hurry.

For comb building to occur to the best

advantage there needs to be foundation over a brood nest, high temperatures, and a lot of bees full of nectar, honey, or syrup with no place to put it. At least, these are some of the major requirements.

On July 25, 1976 in northeastern Ohio I selected a reasonably strong colony and took out a full frame of capped brood with the queen and put it in an empty hive body. With this were placed nine frames with new foundation. This was placed over a slatted rack on a new bottom board and the whole thing placed on the old hive stand.

Above this was placed an Illinois depth super with ten frames of new foundation. With an empty super to act as a "funnel" the adult bees were all brushed or gently shaken into the newly prepared hive. As the frames of brood were cleared of adult bees they were immediately placed on other colonies to be cared for.

Next an inner cover was placed over the 6-5/8 super and four gallons of 2 to 1 syrup inverted over the inner cover on strips of wood to allow the bees access to the syrup.

Enough holes were put in the lids to allow all the adult bees to become gorged on syrup as quickly as possible, with no comb to put it in. A week later the syrup was about used up and another four gallons was put on. At the end of two weeks all foundation had been perfectly drawn, a lot of syrup was stored and there was a rapidly expanding brood nest.

This colony came through the hard winter of 1976-77 in excellent condition.

As soon as the brood which had been placed over queen excluders on two other colonies had emerged, the combs were placed over inner covers. As the honey was taken down, it was easy to sort the combs and use the good ones to immediately replace poor ones in other colonies. Of course, replacement could occur anytime after the combs were taken from the original colony. Poor ones, now empty, could be discarded.

The cost was a little time and \$7.00 worth of sugar.

Since then this idea has been used several times and there are few poor combs left in close to seventy colonies.

This year, faced with the need for a lot of frames and foundation in a new location and no equipment or shop available, I decided to try a new molded plastic frame-foundation unit.

Repeating the procedure described earlier resulted in three colonies with perfect brood combs that should last indefinitely. There were no problems with cross comb or anything. The main difference in handling these frames seemed to be the necessity of holding them by the ends. The top part of the

frame is difficult to grasp except at the end.

In these three cases time was short and the operation was performed before the close of a somewhat delayed honey flow with one result which hadn't been anticipated.

As the supers of brood (from these three hives) which had been placed on other colonies began to emerge, those colonies were rapidly strengthened and there was more surplus honey in those supers than would otherwise have been obtained. It is probable that the value of the sugar used on the "comb builders" was made up, or more so, by the value of the extra honey from the strengthened colonies.

Since the summer of 1976 I have used the idea of "force feeding" syrup to build up strong nuclei for increase. This has been quite successful even when the nuclei were started in middle to late July.

Last summer, after returning to Tennessee the last days of August, I reduced

two colonies to a single brood nest, again placing the extra supers on other colonies. A full depth hive body with plastic frames was placed over each hive body. All adult bees were kept on the original stand.

Again the syrup was pushed hard but conditions were altered. There were more places to put honey or syrup, more brood to feed and fewer bees full of syrup with nothing to do. Also the season was late.

Those two colonies took quite a lot of syrup and only fourteen of twenty frames were well drawn. The stimulation did cause more brood rearing and the colonies are in good shape.

One result of these experiences is an understanding of the wisdom of the advice given in one beginner's book to the effect that new colonies should be fed syrup until the brood nest is completely full even if it takes a hundred pounds of sugar.

Whether it is a package, a nucleus, a split, or a swarm on new foundation, it will pay to follow that advice if at all possible.

YOUNG BEEKEEPER SCIENCE FAIR WINNER

DONNA MORRIS, a 13-year-old with one colony of bees was a first place winner in the Floyd County (Georgia) Science Fair. Her category was zoology.

Donna is an eighth grader at Pepperell

Jr. High School in Lindale, Georgia, and is a member of the newly organized Cedar Valley Beekeepers Association. Her parents are Mr. & Mrs. John Morris, also beekeepers.



What Price Comb Honey?

"We beekeepers are not pricing our honey realistically."

By ROBERT SNIBBE
Clearwater, FL.

IF I were a full time beekeeper who had to live off of the "profits" from selling comb honey, I'd sell my hives fast and find something else to do. The reason is that the present retail price of comb honey has no relationship to the cost of producing it. Beekeepers, in my opinion, are not pricing their honey high enough to cover the cost of packaging and labor, much less the initial investment in equipment or bees and the labor of tending them all during the non-producing months.

First, let me say that I'm a part-time beekeeper, have only been keeping bees five years, only have two hives (each of which has only one Cobana comb honey super) and until this season have given away to my friends all of the honey I produced other than what my family used.

Also, let me say that I can't tell you how much I have enjoyed beekeeping and how much I have been fascinated by my bees. The only thing that has been a real pain-in-the-neck has been the installation of new wooden comb sections and foundation. So when I saw the ads for the new Cobana plastic frames and rings in **Gleanings**, I immediately ordered two complete sets and installed them prior to the honey flow last spring, which starts here in Florida in March.

Not only were they a snap to install but the bees loved them and filled them fast. I began to get so many beautiful combs, I ran out of friends to give them to. Practically every four weeks my busy little bees produced 36 Cobana combs in each hive and while my family and I can gobble up two or three combs a week and I gave one or more to each of our many honey-loving friends, the "extras" really started to pile up. So I said to myself, "Why don't you try to sell some of it?" So I did.

Sales

Not knowing how to price the combs to retailers, I checked the monthly honey report in **Gleanings** which showed that the retail price for a 16 oz. comb was \$1.69 in Region 4. (Region 5 was not given.)

Assuming that retailers would want a 50% markup (which would mean that the wholesale price of a 16 oz. comb would be 85 cents), I offered my first combs to a roadside stand for 75 cents and sold 12. They sold them for \$1.50.

The next 12 I sold to a coffee and tea shop for 85 cents and they sold them for \$1.69. They sold out in a few days and called and asked for more.

The next 12 I sold to a health food store for 90 cents and they sold them for \$1.89. They also sold out fast and called for more.

So, for the 36 combs I averaged 83 cents and at that point, I thought I'd better figure out what the combs were costing me and whether I was making any more or not.

COST OF SALES

See Chart

This was **not** including my initial investment in 2 hives, the bees, bee suit and equipment or hive management the rest of the year before and after the bee flow.

So, I quickly discovered that when I was selling combs at an average wholesale price of 83 cents, I was losing 50 cents per comb.

To just break even on my costs, I should have charged \$1.33 per comb to

the retail stores who would have been forced to charge their customers \$2.66 each per comb. And the question is, would customers pay it?

Of course, I only have two hives and am not equipped to make and sell comb honey on a production line basis. Nevertheless, while some saving could be made in buying Cobana combs in larger quantities, removing the combs, packaging them, refilling the frames with new rings and foundation could not be done much faster by a worker doing it all day, every day.

I also think a beekeeper is certainly entitled to at least as much pay per hour as a skilled worker.

So I believe we beekeepers are not pricing our honey realistically to give ourselves a fair return on our cost of materials, our labor or selling costs, much less our initial investment and hours of work during the year when the bees are not producing.

(Continued on page 260)

Material Cost

The materials cost for 36 Cobana combs was as follows:

72 plastic rings (2 for each comb)	\$ 4.14
72 clear plastic tops (2 for each comb)	5.80
36 labels at 5.5¢ each	1.98
	\$11.92
Divided by 36	
Materials cost per comb	33.1¢
1 sheet of foundation per frame	
divided by 4	7.0
Total cost per comb	40.1¢

Labor Cost

Put on suit, light smoker, hook up vacuum, remove top cover, remove honey super, carry super to work area, remove 9 frames, blow bees off, move frames indoors, clean up area, remove suit, store vacuum and smoker . . .	48 minutes
Remove 36 combs from frames	32 "
Put on tops and labels.	45 "
Refill frames with 72 rims and install foundation	27 "
Install frames in super, dress, remove top cover, put on super, replace top cover, undress and store gear . . .	8 "
Total.	160 " or 2 hours 40 min.
Beekeepers labor--2.6 hours at \$10 per hour =	\$26.00
Divided by 36 combs =	72.2¢

Selling Cost

Deliver 36 combs and return home -- 1/2 hour	
at \$10 per hour.	\$5.00
Car expense -- 10 miles at 25¢ per mile	2.50
Total selling cost.	\$7.50
Divided by 36 combs	20.8¢
Total cost per comb: Materials	40.1¢
Labor	72.2¢
Selling	20.8¢
Total	\$1.331

NEWS and EVENTS



OHIO Beekeeping Schools

The Ohio Agricultural Extension Service, acting through Dr. Tom Sanford, Beekeeping Specialist, The Ohio State University, and cooperating beekeeping associations have initiated a series of sectional bee schools around Ohio that are proving to be very popular.

On March 24th over 200 people attended a beekeeping program at the Research Center in Wooster, Ohio. The Tri-County Beekeepers Association was the sponsoring group. A program aimed at the beginner's interests included demonstrations and lectures.

The Tri-County Beekeepers Association is composed of members from Wayne, Holmes and Ashland counties. Meetings are held the last Wednesday of each month at 7:30 P.M. at the Agricultural Technical Institute, Wooster, Ohio.

OHIO Stark County Beekeepers Association

"Bees for Beginners", a program sponsored by the Stark County Beekeepers Association of northeastern Ohio, drew much interest at the Kent State University Branch Campus on March 31st.

Being oriented to the beginning beekeeper the program was particularly noteworthy in that several of the demonstrations stressed self-help. Tom Tonn demonstrated his methods of hive building and Walter Crawford exhibited many ingenious devices he has built in his home workshop.

The Stark County Beekeepers Association holds its meetings on the third Sunday of each month at the First Federal Savings and Loan in Louisville, Ohio, 315 E. Main from 2:30-5:00 P.M. John Mills is president, Christina Wilson, Secretary.

OHIO Tuscarawas County Beekeepers Assoc.

The meeting of the Tuscarawas County Beekeepers Association will be June 10 at 12 O'clock noon at Ninevah Grange Hall on State Route 416 out of Tuscarawas, Ohio. There will be a picnic lunch and door prizes. Anyone interested in bees is welcome.

MINNESOTA Minnesota Beekeepers Assoc.

The Minnesota Beekeepers Association, Inc., will hold its annual summer meeting at the Holiday Inn Complex located just off U.S. Highway 10 in Detroit Lakes, Minnesota.

Meeting dates are: Thursday, July 19th, evening discussion and social hour; Friday, July 20th, all day with banquet and queen coronation in the evening; Saturday, July 21st, A.M. sessions only.

The Convention will be highlighted by Dr. H. Shimanuki from the USDA, Beltsville Lab. Other activities will include the selection and coronation of the 1979-80 Minnesota Honey Queen. All beekeepers are invited to attend.

OHIO Bee School

Butler, Warren and Hamilton County beekeepers associations and the Cooperative Extension Service are co-sponsoring a Beekeeping School on May 5th at Lakota High School, 5055 Tylersville Road in Butler County beginning at 8:30 A.M.

Dr. Malcolm T. Sanford, Ohio State University Entomologist will present a program that is vital both for the experienced beekeeper and for those who are just interested in finding out more about bees. The bee associations will give live bee demonstrations and display beekeeping equipment.

Pre-registrations should be sent to Don Cooke, 731 Miami Avenue, Terrace Park, Ohio 45174 with the reservation fee of \$6.50 per person for reservation and meal.

For more information on the program or for reservation forms contact Don Cooke, phone 513-831-3692 or call your local extension service office.

PENNSYLVANIA Beekeeping Short Course

The annual beekeepers short course will be held on the main campus of the Pennsylvania State University from July 30 to August 4, 1979.

Registration fee is \$40 for Pennsylvanians and \$45 for non-Pennsylvania residents. Fee is payable at the time of registration on July 30.

In considering University housing, registration is from 2:00 to 3:00 P.M., Monday, July 30. Classes begin at 3:00 P.M. Housing reservations must be made before July 23.

To enroll in the short course for the registration form send to Office of Short Courses in Agriculture, 306 Ag. Admin. Bldg., The Pennsylvania State University, University Park, PA. 15802.

Please Note: Bring your own veil and gloves.

NEVADA Northern Nevada Apiculture Society

On February 26, 1979 hobby beekeepers from northern Nevada met and accepted a proposed Constitution for an organization to be named the Northern Nevada Apiculture Society. The purpose of this organization is to promote the art and science of beekeeping among hobbyists and to educate the general public as to the value of the honeybee.

Officers were elected as follows: President Orton Steel, Reno; Vice-President Ollie Byrd, Fallon; Secretary-Treasurer Bob Weiser, Sun Valley. Directors are: Thomas G. Muncey, Sparks and Harry Brown, Carson City.

Meetings will be held monthly on the second Monday of the month from 7:00-9:00 P.M. The public is invited.

NEW YORK Beekeeping Short Course

A beekeeping short course will be held at Cornell University, Ithaca, N.Y. 14853 on July 20, 21, 22, 1979. (\$10 advance registration required).

Participants will stay in student dormitories and eat in the university dining room. Lecture and demonstration rooms are air conditioned; the dormitory, dining room and lecture hall are within a few hundred feet of each other. Enrollment will be limited. The cost is \$70 per person. This includes a single room for two nights, three meals on Saturday and two on Sunday, all instruction materials and registration fee. Double rooms are \$5.00 less per person (total \$65.00). Full linen service is provided. Registration forms may be obtained from: Office of Apiculture, Dept. of Entomology, Comstock Hall, Cornell Univ., Ithaca, N.Y. 14853.

(Continued on page 257)

**20th Anniversary Sale
Summer Package Bees and Queen Sale
Three Banded Italians**

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Prices After May 20th

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2 lb. pkg. w/q	\$15.50	\$15.00	\$14.75	\$14.50
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Queens	3.25	3.00	2.75	2.50

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PRODUCTION OF QUALITY QUEENS

(Continued from page 241)

If weather conditions are suitable and drones in good supply the young queen should lay on the 10th day after emergence. Mating commences about the 5th day or the 6th, and may continue to the 8th or 9th day.

Too few queen breeders give enough consideration to their drone population, also their quality. It has been my contention for years, that each queen required six or seven individual matings in order to produce satisfactory numbers of fertile eggs during her lifetime, however, a film recently taken of a mating virgin has proved me wrong. The mating virgin filmed mating to 11 separate drones. This gives us some idea of the drone population that must be maintained during the queen rearing season. Drones should be

in sufficient numbers to assure ready contact for mating virgins. Quality of drone is also essential, not only from a breeding standpoint, but also from a rearing view. Drones reared under adverse conditions are often found to be sterile or partially so. Care should also be exercised where special matings are desired to have at least 10 miles clearance from foreign races.

Once the young queen has laid in sufficient brood to assure the strength of the nuc, she is examined for valuation. If satisfactory she may be either used in the apiary or caged for shipment; 24 hours after removing, a new cell may be given the nuc and the process repeated. A word of caution, young laying queens should not be removed from nucs until their first eggs hatch. There is a danger especially in broodless nucs, of the bees removing all eggs except those required for anticipated queen cells.

If quality queens are your desire the extra time, labor and skill required to rear them over ordinary commercial methods is a small price to pay. There is also the self satisfaction derived from having been instrumental in producing queens who in turn will show up well above those reared under ordinary methods. There is no short cut to quality.

MY BUTTERFLY NET SWARM "CLINCHER"

(Continued from page 250)

implement and fold the bag before my little friends escape.

I have to check myself from wanting to lower the net after the first two bumps. But I do, and wait a short time for the uncaptured bees to reassemble. I bump the limb several times in trying to get them all in the net without lowering it. If the pole and net are hindered by obstructing branches, I can take my time in disengaging during the lowering process.

I bump the bees down to the bottom of the bag and tie it off and if there are bees on the side of the bag, I slip the whole into another bag. The nylon curtain material seems to provide adequate ventilation.

Installation in a hive goes as smoothly as does the capturing, most of the time. The plastic funnel works as well in reverse to direct the swarm between frames. I take 3 or 4 out of the hive that the swarm may be deposited on the floorboard with a hope of prohibiting the queen from taking wing before I can set the top cover.

As a precaution to prohibit the queen from absconding I always seal up all the cracks and holes and place a queen trap on the colony immediately and leave it on for several days or until after I have inspected the frames for eggs. This precaution is standard procedure with all swarm installations and will prohibit most swarms from absconding. It seems that about half the time my installed swarms will leave when the queen gives the colony the "go" signal. I find her working furiously trying to get through the bars of the trap. Even if I find the swarm clustered outside I let them stay without trying to recapture them. In due time they return to their queen. The colony may try to stay in the queen trap but I smoke them and drive the swarm back into the hive. Seldom do I have to smoke them more than once to succeed.

If the swarm to be hived appears nervous and inclined to take wing before I shake them out of the net I use my water atomizer to slow down the tendency.

NEWS & EVENTS

(Continued from page 256)

OHIO

Mid-Ohio Valley Beekeepers Assoc.

The regular meetings of the Mid-Ohio Valley Beekeeper's Association, located at the Vienna Community Building, 34th Street, Vienna, W. Va., will be held on the following dates:

May 21-Gordon Rudloff, State Apiarist of Ohio, will present a program titled "Honeybee Diseases".

June 18-Dr. Tom Sanford, Extension Apiculture Specialist of O.S.U. will give a talk on "Queen Rearing".

All interested beekeepers in the area are most welcome.

WILDWOOD APIARIES

Box 161, Starkville, Mississippi 39759 Ph (601) 323-2341

MRAZ QUEENS

FRUGAL PRODUCTIVE DISEASE RESISTANT

Booking orders for 1979 Queens from about April 5, depending on weather.

1-10\$6.00 11-25.....\$5.75 26 & up.....\$5.50

Clip or mark 25¢ 1-10 Cash with order.

11 & up 15% to book, balance due 15 days before shipment.

LIVE DELIVERY GUARANTEED TO U.S. & CANADA. PRICES SUBJECT TO CHANGE WITHOUT NOTICE. Queen yard manager is Page Simpson, who has been working bees since 1928 and producing good Queens since 1949.

QUEENS

CAUCASIAN

1-10	\$6.40
11-39	5.90
40-99	5.55
100-499	5.25
500-up	5.05



MIDNITE

1-10	\$6.80
11-39	6.30
40-99	5.95
100-499	5.65
500-up	5.45



On all orders and shipments of less than 10 queens, add \$1.00 per shipment.

For clipping and-or marking add 50¢ per queen.

HOWARD WEAVER & SONS

Rt. 1 Box 16-A

Navasota, TX 77868

Phone 713-825-7714

1979 QUEENS

Three Banded Italians

Any Number

Prices starts May 20th

1 - 9 \$3.50	10 - 24 \$3.00
25 - 99 . . . 2.75	100 - up 2.50

Gregg & Son's Honey Bee Farm

Rt. 2 Box 55-B

Millry, Ala. 36558

Phone: 205-846-2366

BEE LOCATIONS

(Continued from page 237)

the years we also learned that a lot of hives are not registered and do not show up on the state maps. The state, in order to protect beekeepers, does not let you copy the maps or write down locations but you may check areas where you want to place your bees and see how close your competition is. We then were able to pick 12 good sites out of 25-30 possible sites. By advertising, we also had people who wanted us. We also located areas that did not seem to have many bees.

By this time, we had picked the best sites and were settled for the year. However, late in the spring we had to relocate a yard because our bees started to bother the farmer's wife. At a loss for what to do we drove to the area in the

county in which we knew there were few bees and started knocking on doors. At the third farm we were greeted with open arms and to this day it has been one of the best locations. When you knock on doors you'll hear one of three responses; 1. A big "No", 2. "Are you some kind of a nut?", and 3. A "Yes!". We'd like that. For rent we allow 2 pounds of honey per hive. We bottle it in queenline jars and provide an individual label that says it came from their farm. This makes the farmer very happy when he hands out gifts of honey during the year.

Since next year's dreams and expansion require preliminary planning the ultimate in site selection was done this year. We rented a plane. This was simple and done at a reasonable cost. A friend with a commercial license took us up as he

ITALIAN QUEENS ONLY

Health Certificate Included

Queens \$4.25 each air mail postpaid

Clipping 25¢ & Marking 25¢

GULF COAST BEE CO.

SCHRIEVER, LA. 70395

needed the hours to get additional experience. We decided to fly on a nice day early in the morning so that we would have an easy flight. We wanted to see how crowded our county was and if there was any pasture left. We thought an hour would be sufficient and stayed up for 1.3 hours. We found picking sites from the sky to be an exciting start for next year.

Having travelled our county for 9 years I thought I was very familiar with the area and the land. From the sky, flying at 600 feet, I was amazed to discover plenty of additional good areas for site locations. But the most interesting discovery was the amount of alfalfa, basswood and other pasture available in all directions. Being in the air and being able to look in all directions visually illustrated why the honey yields in our area are usually 90 pounds or better per hive. A rough tabulation from the air points out 1/3 of the acreage to be bee pasture. This would mean 1 square mile for each 3 square miles surrounding a yard. What is the potential of our area? I do not know but I'm satisfied there is plenty of room for more. I now have the areas picked that I want to expand to and I have just to knock on some farmer's door this winter.

THE HONEYBEE KNOWS ALL THE ANGLES

(Continued from page 238)

combined efforts of highly intelligent, trained and experienced individuals. In spite of that, man has yet to come even remotely close to matching the levels of design found in the small brain of the honeybee.

Can anything, then, but a highly skilled and creative Being account for the bee's remarkable behavior? By any logical standards the answer to this question should be obvious.

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PRICES THRU MAY 20th — 10% REDUCTION AFTER THAT DATE
"Old Reliable" Hybrid Italian Bees Preferred by Leading Honey Producers

	1-24	25-99	100 up
Queens	\$ 6.00	\$ 5.75	\$ 5.50
2 lb. pkg. w/q	17.00	16.50	16.00
3 lb. pkg. w/q	21.00	20.50	20.00
4 lb. pkg. w/q	25.00	24.50	24.00
5 lb. pkg. w/q	29.00	28.50	28.00

Tested Queens \$2.00 each extra.

For prices on queenless pkgs., deduct \$3.00 for queen.

Now booking 1979 orders. Shipment made by your car, truck, or trailer. Deduct 75¢ each for your usable screen cages from above price. Book early for most desirable shipping dates. 10% deposit required for booking—balance due two weeks prior to shipping date. MAY WE BOOK YOUR ORDER NOW? Parcel Post Orders: Postage, Insurance, Special Handling and Labor.

2-lb. package \$5.50 ea. 3-lb. package \$6.50 ea.

4-lb. package 7.50 ea. 5-lb. package 8.50 ea.

Prices Subject to Change Without Notice.

Shipments of less than 10 Queens add \$1.00 Shipping cost.

All larger Shipments postpaid airmail

Packages F.O.B. Shipping Point

Queens clipped, 25¢ each extra.

Clipped and marked, 50¢ each.

Postage must accompany all parcel post orders.
References: Union Bank & Trust Co., Montgomery, Ala.; Any
Bee Journal in U.S. or Canada; any Extension Agent.

M. C. Berry & Sons Montgomery, Ala. 36101

P.O. Box 684 Phone: 205-262-0668 or 205-269-9998

Eighty-two years of Select Breeding with the Bees

Accredited and Certified — The Best in America

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Prices starts May 20th

1 - 9	 \$3.50	10 - 24	 \$3.25
25 - 99	 3.00	100 - up	 2.75

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Rt. 2

Box 55-B

Millry, Ala. 36558

Phone: 205-846-2662

THREE BANDED ITALIAN BEES & QUEENS

	1-9	10-49	100-up
2-lb. pkg.	\$15.50	\$15.00	\$14.50
3-lb. pkg.	20.50	19.75	18.75
(postage not included on packages.)			
Queens	5.75	5.25	5.00
(Parcel post included on queens)			

Insurance and live delivery guaranteed only within zone 4.

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Rt. 2, Box 19-A, BUNKIE, LA. 71322

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Micheal Turner - Ph: 318-346-4382 R. D. Turner - Ph: 318-346-6424

Truck loads are welcome

10% deposit will book your order — balance payable four weeks before shipping.

NEW BULLETINS AND INSTRUCTION MEDIA

NEW IBRA REPRINTS

Control of Wax Moths: Physical, Chemical and Biological Methods by H.D. Burges (M96), price 40p or 95 cents each, post free. Dr. Burges has been investigating the use of *Bacillus thuringiensis* to control wax moths, as part of the program of a research team studying insect diseases in England. In this article he reviews the various methods available for control, especially of *Galleria mellonella*.

A Calendar of Bee Plants by Dorothy Hodges (M94), price 30p or 70 cents each, post free. This calendar, compiled in southeast England, has been re-issued with an explanatory text and English and Latin plant names, in response to the many requests received.

IBRA Research News No. 16, The Varroa Mite by Dr. Eva Crane. It is vital to prevent the further spread of the bee pest *Varroa* throughout the world and this leaflet should receive the widest distribution; a single copy will be sent free.

Any of the above publications can be obtained from International Bee Research Association, Hill House, Gerrards Cross, Bucks SL9 0NR, England.



If Interested In Top Quality Queens

Order From

W. E. HARRELL & SONS

Our strain of three banded Italian bees and queens has stood the test on the market for many years, for commercial users on a large scale, as well as hobbyists. For 59 years they have proven themselves to be among the best all over the world. In 1978, we shipped queens to 35 states, 7 foreign countries and 5 Canadian Provinces. Our queens are used both by beekeepers who winter their bees, and ones who use package bees entirely, and have been found to be very satisfactory by both.

They are gentle, prolific and very resistant to diseases. Each year we receive many fine letters complimenting our bees on their splendid results in productivity and adaptability to all climates. It is our aim to please you in every respect and our desire, at all times, to send you the very best product on the market. We have the bees, queens, equipment and trained men to give you 100% service on short notice. We have a large output and rear every queen and package that we ship.

ITALIAN PACKAGE BEES WITH QUEENS F. O. B. HAYNEVILLE

(No packages shipped by mail.)

	2 lb. pkg.	2 1/2 lb. pkg.	3 lb. pkg.	4 lb. pkg.	5 lb. pkg.	Queens
1-24	17.00	19.50	22.00	28.50	32.50	6.00
25-99	16.50	19.00	21.50	28.00	32.00	5.75
100-up	16.00	18.50	21.00	27.50	31.50	5.25

For shipment after June 1st

QUEENS	1-24	5.25
	25-99	4.75
	100-up	4.25

WE FEED FUMIDIL B TO ALL NURSE COLONIES, NUCLEI AND PACKAGE PRODUCING COLONIES.

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Now booking orders for Spring 1979. Four frame nucs with laying Italian queens - \$40 each. Price includes postage and insurance. For quantity orders call 912-794-2470.

Rt. 1, Box 53 Hahira, Ga. 31632

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BEES & QUEENS

POSTPAID (TO FOURTH ZONE)

1-4	2 lb. pkg. w/q	\$20.50
5-up	2 lb. pkg. w/q	19.50

FLOYD'S APIARIES

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WISCONSIN - IOWA - MINNESOTA

COMMERCIAL PRICES FOR ALL
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Griffin Apiaries Company

Starline and Italian

STARLINE	1-24	\$5.90
	25-99	5.70
	100-up	5.60
ITALIAN	1-24	\$5.50
	25-99	5.30
	100-up	5.20

Queens Available March 15th

Breeders of Quality Queens

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Phone: 813-533-1839
813-533-5735 (home)
813-533-1788 (after 5)
10% deposit on orders

WHAT PRICE COMB HONEY?

(Continued from page 255)

I happen to believe that a comb of beautiful natural honey is a gourmet food and a delicacy as good or better than caviar and should be priced accordingly.

I also happen to believe that a comb of honey, whether in wood or plastic, costs more to produce and package than an eight ounce bar of Baker's chocolate which is mass-produced and machine-wrapped in paper for which my wife paid \$1.89 last week in a supermarket.

So, in conclusion, while President Carter has urged us to hold price increases to 7-1/2%, I humbly suggest that we beekeepers should look at our costs realistically, charge for our materials and labor and selling costs on an equitable basis in relation to what other workers are getting, market our delicious product as a delicacy and a gourmet food which is getting harder and harder to produce, and price our product accordingly.

MONTHLY HONEY REPORT

(Continued from page 222)

feeding was necessary during early spring. Good moisture condition.

Oregon-Bees are doing well. Weather has been favorable in early spring. Prospects for a good crop looks better than a year ago.

Washington-Bees in good condition. Moisture conditions are good.

California-Wholesale honey supplies limited. Demand is strong for both light and dark honeys. Retail honey sales good. Pollination contracts bringing good rental fees.

**Keep Gleanings
Coming**

GLEANINGS IN BEE CULTURE



ITALIAN PACKAGE BEES & QUEENS

Bees Bred for Honey Production

In lots of	Queens	2-lb. w/Qn.	3-lb. w/Qn.
1-24	\$6.50	\$18.25	\$23.50
25-99	6.00	17.50	22.75
100 up	5.50	16.75	22.50

20% Down Books. Please Add Sufficient Postage.

Quality Satisfaction & Dependability
with personalized service

DONALD E. RUSHTON APIARIES

Rt. 6, Box 15

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ALL PURPOSE ITALIAN QUEENS

Bred for the honey producer, the pollinator the pollen collector. Gentle enough for city back yards.

Available March 20 through June 1, 1979

Laying mated queens	1-5	\$5.75
Air mail postpaid	6-20	5.00
Clipping no/chg.	21-49	4.75
Marking 20¢	50-up	4.50

No package bees

Hel-Le Bee Farm

P.O. Box 95

Phone: 904-468-1494

Hampton, FL 32044

ITALIAN BEES & QUEENS (Postage Paid)

PACKAGES		QUEENS	
2 lb. w/q	3 lb. w/q	Until June 1	After June 1
1-24 \$20.00	\$24.00	\$5.00	\$3.50
24-99 19.50	23.50	4.90	3.10
100-up 19.00	23.00	4.75	2.90

CLIP OR MARK QUEENS - 25¢

PACKAGES BEE PICKED UP AT APIARY

2 lb. pkg. w/q	1-99	\$16.75	100-up	\$15.75
3 lb. pkg. w/q	1-99	\$20.75	100-up	\$19.75

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Better Bred Queens Three Banded Italians

An old shipper with up to date operation. 1979 — our 51st year. Capacity — 5000 nuclei, efficient help, quality surpassed by none. Our Better Bred Stock is as good as money can buy anywhere. Let us serve you.

QUEENS		PACKAGES	
		2 lb. w/q	3 lb. w/q
1 thru 4	\$6.25	\$22.50 ppd.	\$27.50 ppd.
5 thru 24	5.75		
25 thru 99	5.50		
100 or more	5.00	Truck prices	16.00 21.00

A. L. Webb Sr., Manager

205-829-6183

Jessie S. Knox, Secretary

205-829-6074

CALVERT APIARIES INC.

CALVERT, ALA. 36513

QUALITY ITALIAN QUEENS

1-25	26-50	51-99	100-up
\$5.10	\$4.92	\$4.85	\$4.60

Clipped 25¢

Marked 25¢

ARKANSAS APIARIES

500 E. Market

SEARCY, ARK. 72143

Ph: 501-268-3581

FROM THE WEST

(Continued from page 244)

ago I performed the whole operation with a beginner and we did it in jig time. Later on after you want to expand you can start thinking of all that highly efficient and expensive equipment you will need. But not for the first year.

And now I am going to close with a beautiful letter from a beekeeper's loving wife. "Dear Mr. Koover. Your article in the February '79 **Gleanings** is among the best reasons for keeping bees that I've seen. My husband has kept bees for about six years now and what wonderful things these marvelous little creatures have taught this intense, perfectionistic man. Having been raised in a more rural setting than he, I have always followed Nature with her many foibles....the sunset predicting my laundry plans for tomorrow, the gust of wind direction telling me to bundle the children up more warmly today. He was not as fortunate. Our bees are his teachers.

"How he enjoys 'going down to the bees'! The quietude, their industrious habits, their very personalities are teachers. His scientific bend will always be with him, but his acceptance of Nature's quirks is more obvious with each beekeeping year.

"They are intriguing—a scientific satisfaction. They are industrious among the beauty of Nature—a personal satisfaction. They are tenacious amidst the terrors of winter—an uplift in discouraging times. They demand little and give so much—almost an unknown in our time.

"They are independent in the midst of their community, and fiercely brave defending their homes in this era of cowardice.

"No, my husband does not possess the above negative qualities but our bees teach us both to see the beauty in our lives and to accept what we cannot change.

"Thank you for putting into print the lessons why we small beekeepers relish our 'hobby'."

AMERICAN HONEY PRODUCERS CONVENTION—1979

(Continued from page 233)

suspected bee kills that may have been caused by the use of insecticides including, but not limited to, Carbaryl (Sevin) or any micro-encapsulated insecticide including Methyl Parathion, PennCap-MO or Ethyl Parathion (PennCap-E).

Approved in meeting assembled at the Airport Hilton Inn, St. Louis, Missouri, February 8, 1979.

KEEP

GLEANINGS

COMING



TAMPA BAY CHOOSES HONEY QUEEN

TAMPA BAY Beekeepers Association chose Mary Beth Lorton, 17, daughter of Mr. and Mrs. Carl Lorton, 17001 Hanna Road, Lutz, Fla., as their 1979 Honey Queen at the January meeting.

She will represent Tampa Bay beekeepers at the Strawberry Festival at Plant City, Fla., March 2-10 and at other events in the Tampa Bay area before competing for the title of Florida Honey Queen in October, 1979.

Mary Beth is a senior at Hillsborough High School where she demonstrated creative talents as co-editor of the annual school calendar for 1979 in the manner of displaying the photographs.

Her hobbies include piano with a preference for Beethoven, swimming and modern dance. She helps her father and grandfather with their bees also.

She plans to attend the University of South Florida to major in biology or mathematics.

BEES INCREASE CANTALOUPE PRODUCTION

INCREASING the bee population in cantaloupe fields increases both the number and the size of melons U.S. Department of Agriculture researchers say.

Thomas E. Mouzin, research technician at the Fruit and Vegetable Insects Research Laboratory here, placed four hives per acre on four different melon farms in the Vincennes area in 1977.

Mouzin counted, measured and weighed the melons at various distances from the hives. Mature fruit near the hives averaged 4.9 pounds each. Melons from areas 200 yards or more from the hives averaged 4.5 pounds each. The 0.4 pounds-per-melon weight difference becomes significant when multiplied by the thousands of melons harvested per acre, Mouzin says.

"Not only were the melons 8.8 percent heavier", he said, "but the plants close to the hives produced 23 percent more melons than those away from the hives."

Mouzin repeated the tests in 1978, reducing the number of hives to one or two per acre, and found similar results.

David K. Reed, research and location leader at the laboratory, says the results indicate the one hive per acre provides enough bees, but we need more tests to make a more accurate recommendation.

HOT DIP PRESERVES HIVES

By **GEORGE B. HINTON W.**
San Luis Potosi, S.L.P., Mexico

WE, AT Hinton Honey, buy wood hives unpainted and dip them in a very hot (more than 100°C) mixture of second grade paraffin wax and rosin, 50% of each. We immerse the hive with bottom board attached into the mixture, which at that temperature is liquid like water, holding it under for about a minute to give the wood time to get hot so that it will absorb as much wax as possible in that time. Then it is allowed to drain for a few seconds above the tank until the excess wax runs off. In a few minutes no wax will be visible on the surface of the wood, and while it is still slightly warm, the hive is again dipped into the wax and rosin mixture but only for a second or two and is then removed, thus allowing a very thin coating of wax to remain on the surface. This coating keeps the hive waterproof for many years in spite of wind, rain and sun. A little experimenting has to be done to find how long to keep the hive submerged on the second dipping so as to get the right thickness of wax on the surface of the wood. The longer the hive remains in the wax, the thinner the coating will be.

After the first dipping, the hive may be painted and the paint will adhere to the wood as the surface is still porous. After the second dipping, if the hive is painted, the paint will not stick firmly and will rub

PARCEL POST PACKAGE BEES

2 lbs. with queen, \$25.00

3 lbs. with queen, \$30.00

ITALIAN QUEENS

1-4, \$6.50; 5-25, \$6.00

CARNIOLAN QUEENS

1-4, \$7.50; 5-25, \$7.00

3-FRAME NUCS

Loaded with bees, sealed brood and a young queen.

1-3, \$38.50; 4-25, \$35.00

Prices include shipping, insurance and special handling. 20% books order. Write or call for prices of larger orders.

HIGH SHOALS APIARIES

High Shoals, GA 30645

(404) 769-6638

off with the slightest abrasion. It is the writer's opinion that the second dipping in wax is better than painting after the first dipping.

We have hives in the field treated in the manner described above which are in their 7th year and have not needed a single repair and are still as sound as when new. These hives look terrible because the wax seems to absorb the dust, but they don't warp, crack or come apart at the joints. The bottom boards of these hives, though resting on the ground, show no rotting or damage by termites. Our painted hives used to need repairs after one or two years in the field.

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& The Advertising Council

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are
dying
for your
help.
Give
blood.**

**Red Cross
is counting
on you.**

THE STOVER APIARIES, INC.

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Phone: 601-327-7223

ITALIAN

STARLINE

PARCEL POST PACKAGE BEES AND QUEENS

In Lots of	Queens	2-lb. & Queen	3-lb. & Queen	4-lb. & Queen	5-lb. & Queen
1	\$6.20	\$25.75	\$31.50	\$37.00	\$42.75
2-24	6.20	23.75	29.25	35.00	40.75
25-99	5.65	22.50	28.25	34.00	39.75

WRITE FOR PRICES FOR 100 AND UP

PRICES INCLUDE POSTAGE, SPECIAL HANDLING, AND INSURANCE FEES.

STARLINES ARE 50¢ EXTRA.

Packages can only be shipped parcel post. To book parcel post orders check or money order must accompany order. Prices are subject to change.

Live delivery can only be guaranteed until May 20, on package bees. We may run late on shipping, but will come as near as possible to your desired shipping date.

TESTED Queens will NOT be available until after May 20th and are \$1.00 Extra. Marking of Queens is 25¢ per Queen.

QUEENS AND PACKAGES TO BE PICKED UP AT OUR APIARY

In Lots of	Queens	2-lb. & Queen	3-lb. & Queen	4-lb. & Queen	5-lb. & Queen
1-24	\$6.20	\$18.00	\$23.50	\$29.00	\$32.50
25-99	5.65	17.25	22.50	28.00	32.00
100-up	5.15	16.50	21.75	27.00	31.00

WE are booked up until May 6, 1979. We can take orders for that time.

REMEMBER!

Ad closing date is
5th of every month.

AVAILABLE FOR 1979 SEASON STURDY

Italian Queens	Nucs	Package Bees
Your laying Queens		
1-9	10-24	25-99 100 up
\$6.00	\$5.75	\$5.50 5.25

Package Bees

3 lbs.	\$23.00	\$22.50	\$22.25	\$22.00
4 lbs.	27.00	26.50	26.25	26.00

NUCS

4 or 5 frames with Brood & Laying Queen

4 Frames - \$24.00

5 Frames - 30.00

(New frames & Wax exchanged)

(Not assembled accepted)

If required we can make up Nucs in your equipment, at reasonable prices.

Can arrange for delivery of reasonable amounts of NUCS.

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BEE FARMS

4 Chappell Creek Rd. Hopkins, S.C. 29061
Phone: (803) 776-5043
Evenings 418-679-4774

QUEENS

Hastings Carniolans

(Because they are better)

QUEENS	1-24	25-99	100-up
May	\$6.00	\$5.00	\$4.50
June 1st on	6.00	5.00	4.00

Sorry — Sold Out on Packages

STRACHAN APIARIES, INC.

2522 Tierra Buena Rd., Yuba City, Calif. 95991

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For Breeder Queens — Write: Hastings, Box 604, Birch Hills, Sask., Canada S0J 0G0

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Italian Queens

Breeder stock selected in Canada and Northern California for Honey Production and Overwintering.

May thru June — \$4.00 per Queen

Minimum shipments 25 Queens

4422 Honey Lane

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I'M TOO LARGE WANT TO BEE SMALLER**

3 - 5 Frame Nucs
Singles, Doubles
79 Queens
April - June
Call for Price, Quotation and Delivery
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**ROOT HEADQUARTERS
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NORTHEAST OHIO**

2-lb. package w/q \$20.00
3-lb. package w/q 25.00
3 Frame Nuc with laying queen
\$25.00
ITALIANS OR CAUCASIANS
Local pickup only
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We ship pure worker bees by your truck, car, trailer
or by parcel post. Prices are F.O.B. Funston, Ga.

With Qns.	2-lbs.	3-lbs.	4-lbs.	5-lbs.	Queens
1-24	\$17.00	\$21.50	\$26.00	\$31.00	\$5.90
25-99	16.25	20.75	25.25	30.25	5.55
100-up	15.75	20.25	24.75	29.75	5.15

Clipping Queens 40¢ each. Marking 40¢ each.
For queenless packages deduct \$3.00
from the 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. \$2.00 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.

Prices subject to change without notice.
Shipping Dates April 1st thru May 20th.

JACKSON APIARIES

P. O. Box 159 Funston, Ga. 31753
Phones: 912-941-5522 912-941-5410

**QUALITY MATED QUEENS
Italian and Caucasian**

1-24 25-99 100-up
\$6.00 \$5.50 \$5.00

Fumidil-B Fed
LIVE DELIVERY AND
PROMPT SERVICE
NUCS AVAILABLE

GLENN APIARIES
1358 East Mission Rd.
Fallbrook, California 92028
Phone 714-728/3731

NOW BOOKING ORDERS FOR 1979

KEYLINE QUEENS AND PACKAGES

ORDER NOW AND AVOID DELAY— FIRST COME FIRST SERVED.

Write for Brochure and/or Price List.

KEYLINE INC., Rt. 2, Box 207, Nauvoo, AL 35578

MRAZ QUEENS

BEE ISLAND APIARIES
Harrells, N.C. 28444

Ph:(919)285-2029 or 285-7450

CAUCASIAN QUEENS

1-25\$4.85
26-100.....\$4.75
101 & up.....\$4.65

VAUGHN APIARIES
P. O. Box 3116
Huntsville, Ala. 35810
Phone 859-0725

1979 Price List

**OTT'S HIGH QUALITY
ITALIAN BEES & QUEENS**

Package Bees Postpaid each
2 lb. pkg. w/q 1-4 - \$20.00 5-up - \$19.00
3 lb. pkg. w/q 1-4 - \$25.00 5-up - \$24.00
Queens
1-4 - \$5.50 5-99 - \$5.00 100-up - \$4.50

Queens prices include AIRMAIL postage
special handling, insurance. Packages
are shipped postpaid, special handling
and insurance.

**PAYMENT BY CERTIFIED CHECK
OR MONEY ORDER ONLY**

Managers: Joe Ott and Clarence Ott
OTT HONEY FARM, INC.
Box 38 Star Rt.
Rolling Fork, MS 39159
Phone: 601-873-6275 or 608-462-5860

Featuring BUCKFAST Queens

Ask for our literature

QUANTITY	ITALIAN	BUCKFAST	POSTPAID
1 - 4	\$6.90	\$7.50	For clipping add 25¢
5 - 31	6.25	6.85	For marking add 35¢
32 - 99	5.65	6.25	For both C/M add 60¢
100 - 999	5.25	5.85	
1000 & up	5.15	5.75	

WEAVER APIARIES INC. Rt. 1, Box 111, Navasota, TX 77868
Established 1888 Phone 713-825-2312

QUEENS

Starline		
1-24	25-99	100-up
\$5.50	\$5.00	\$4.50

Nucs	
\$25.00	
3-frame F.O.B. Dixie Honey Co.	

Italian		
1-24	25-99	100-up
\$5.00	\$4.50	\$4.00

Terms: Under \$100.00 cash with order, over \$100.00 - 25% with order. Balance three weeks prior to shipping date.

DIXIE HONEY CO.

E. A. CANNADY

Rt. 1, Box 350, Shallotte, N. C. 28459

Phone: 919-579-6036

Bank Reference: Bank of North Carolina 919-574-4345



3 Frame
5 Frame

CORRUGATED NUC BOX

Transport Bees On Frames
Pollination Unit
Splitting Hives
Screened Lid
Lightweight
Wax Coated

Swarm Catcher
Water Resistant
Easy Assembly
Economical
Solid Lid
Reusable



3 frame sample send \$3.50 5 frame sample send \$3.50
California residents add 6% sales tax-Specify solid or screened lid
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For information write:
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420 Via Del Monte
Oceanside, California 92054
(714) 439-1572



Italian Queens

Production dedicated to the advancement of Apiculture, for as claimed by Elisha Gallup, "... around the Queen centers all there is in Apiculture."

1-24	 \$6.25	25-up	 \$5.75
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Clipped & Marked —\$5.00 each

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1807 Wexley Rd. 812-336-0320 Bloomington, IN 47401

QUEENS AIR-MAIL

1-25	 \$5.00 each
25-100	 4.75 each
100-up	 4.25 each

CALLAHAN & SON BEE FARM
EUGENE CALLAHAN
Box 31F Theriot, LA 70397
Ph. 504-872-5956

QUEENS

Italian

Nice large queens
Marking 50¢

1-24	25-99	100-up
\$6.00	\$5.50	\$5.00

Clipping 50¢

Caucasian

2,000 - 3 frame nucs with queens and brood \$32.50 each delivered or \$28.00 each on your truck. Queens are personally reared and guaranteed in quality and live delivery.

Queens May 21st on: 1-24 \$4.00 25-up \$3.75 each
Order 1 or 1,000

MITCHELL'S APIARIES
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STARLINE QUEENS

1-25	 \$6.00
26-99	 5.75
100-up	 5.50

10% Books. Balance before shipment.

Jimmie & Kay Oakley
P.O. Box 124
Cedar Lane, Tex. 77415
Ph. 713-245-1978

HOMAN'S

QUALITY BRED CAUCASIAN & ITALIAN BEES & QUEENS

2-lb. w/q	 \$15.00	3-lb. w/q	 \$19.00
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Queens \$4.50

Queens postpaid airmail Health certificate furnished
Shipping starts April 15th
Above price does not include shipping charge on package bees.

HOLDER HOMAN APIARIES

Rt. 2, Box 123-B SHANNON, MS. 38868 Ph. 601-767-3880

Dial-A-Queen 912-985-7200

**Orders received by noon
shipped same day**

ITALIAN QUEENS

1 - 99 .. \$5.89 100 - up .. \$5.30

All queens shipped air mail, postpaid.



P. O. BOX 905 ···· MOULTRIE, GA. 31768
(912) 985-7200

QUEENS QUEENS QUEENS

SUMMER PRICES START MAY 21.

1 - 9	10 - 24	25 - 99	100 - UP
\$3.50	\$3.25	\$3.00	\$2.75

In lots of 200 please write or call for prices

INSURED — AIR MAIL — POSTPAID

QUEENS that have PROVEN THEMSELVES for 33 years. Give them a try, and watch the results. YOU CAN'T BUY BETTER.

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P.O. Box 87 Buckatunna, MS 39322
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\$6.00 each
1.5 kg. package \$32.00 ppd.

GITTA APIARIES
DENTON, MD 21629

QUEENS

Two good strains of bees. Very gentle and good workers.

	Dadant's Starline	Our Regular Italians
1 to 24	\$6.75	\$6.25
25 to 99	6.00	5.50
100 - up	5.50	5.00

Clip and Mark 50¢ each.

GEO. E. CURTIS & SONS, INC.

P.O. Box 507, LaBelle, Fla. 33935 Phone 813-675-1665, 675-1566 or 675-1871



1979 PRICES ITALIAN QUEENS AND BEES

W/q	1-24	25-99	100 up
2-lb. pkg.	\$15.25	\$15.00	\$14.50
3-lb. pkg.	19.50	19.00	18.50

Packages shipped F.O.B. Baxley, Ga.
WRITE OR CALL FOR LARGER
ORDER PRICES

QUEEN PRICES

Postage Paid—Add 70¢ Special
Handling to Total Orders for
10 or Less.

	ALL QUEENS FED FUMIDIL-B
	Until June 15 After June 15
1-24	\$4.35 \$3.00
25 up	4.25 2.75

Queens Marked 20¢ ea. Clipped 20¢ ea.
Tested Queens 50¢ ea.

TERMS: Orders \$100 or more, 10%
deposit and balance due two weeks
before shipment—others cash w/order.

Plantation Bee Company, Inc.
P.O. Box 1087, 105 Brinson Road
VIDALIA, GEORGIA 30474
Telephone: 912-537-9249

QUALITY BRED

ITALIAN QUEENS AND BEES

Bred for Honey Production and Winter Hardiness.

WE are now booking for the 1979 Season.

Queens \$4.50 each Air Mail
Three frame nucs with queen \$30.00 each

Walter D. Leverette Apiaries

P.O. Box 3364 Ft. Pierce, FL 33450

YORK'S--- Quality Bred

1 STARLINES

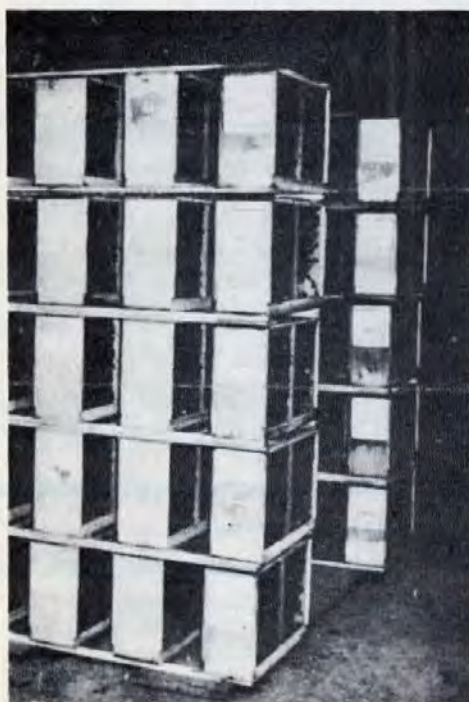
9 MIDNITES

7 ITALIANS

9

The Strains Preferred by Leading
Honey Producers

Have you tried York's bees and service? Make 1979 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 your 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	\$17.00	\$16.50	\$16.25	\$16.00
3-lb. pkg. w/q	21.50	21.00	20.85	20.50
5-lb. pkg. w/q	34.00	33.00	32.50	32.00
QUEENS	5.75	5.55	5.45	5.35

STARLINE OR MIDNITE

	1-3	4-25	26-99	100 up
2-lb. pkg. w/q	\$17.40	\$16.95	\$16.65	\$16.40
3-lb. pkg. w/q	21.90	21.50	21.25	20.90
5-lb. pkg. w/q	34.40	33.40	32.90	32.40
QUEENS	6.15	5.95	5.85	5.75

Prices F.O.B. Jesup

Queenless packages — deduct \$2.00 per pkg.

Tested Queens—add \$1.00 per pkg. or queen.

Clipped and Marked 50¢ each.

Terms: Small orders cash, larger orders \$2.00 deposit per package and balance three weeks prior to shipping date.

**WRITE FOR FREE COPY OF
SHIPPING RATES AND INFORMATION**

Shipments start first of April depending upon spring weather conditions.

APRIL 1979											
S	M	T	W	T	F	S					
1	2	3	4	5	6	7					
8	9	10	11	12	13	14					
15	16	17	18	19	20	21					
22	23	24	25	26	27	28					
29	30	31									

MAY 1979											
S	M	T	W	T	F	S					
			1	2	3	4	5				
6	7	8	9	10	11	12					
13	14	15	16	17	18	19					
20	21	22	23	24	25	26					
27	28	29	30	31							

JUNE 1979											
S	M	T	W	T	F	S					
					1	2					
3	4	5	6	7	8	9					
10	11	12	13	14	15	16					
17	18	19	20	21	22	23					
24	25	26	27	28	29	30					

Help us to help you
ORDER TODAY

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.

YORK BEE CO.

POST OFFICE BOX 307
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THE INTERNATIONAL BEE RESEARCH ASSOCIATION regularly publishes new information on bees, beekeeping, and hive products, for beekeepers and scientists all over the world. Consultant IBRA Representative for USA: J. Engelhardt, 1500 Maywood Avenue, Ann Arbor, MI 48103. IBRA PUBLISHES: **Bee World**, a quarterly journal for the progressive beekeeper. **Apicultural Abstracts**, a survey of scientific literature from all languages. **Journal of Apicultural 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 0NR, England.

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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.

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WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. **HUBBARD APIARIES**, Onsted, Mich.

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

PURE HONEY in 5 gallon pails (60#). Orange Blossom, Clover, Alfalfa, Buckwheat, Wildflower. **HUBBARD APIARIES**, Belleview, Fla. 32620. Ph: 904-245-2461.

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WANTED — All types in drums, tins, truck and car lots. Send samples and prices each lot. Chas. E. Farris Co., Inc., P.O. Box 123, Springfield, N.J. 07081. Established since 1910.

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

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WANTED: All grades of honey in 60's or drums, truck or rail, car load lots. Send sample and price to **DUTCH GOLD HONEY, INC.**, 2220 Dutch Gold Dr., Lancaster, Pa. 17601.

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WANTED HONEY! The Honey Man's Raw Honey. Forest Lake, Minn. 55025. Phone: 612-464-5420, 612-922-5234.

HONEY WANTED: All varieties, any quantity, also comb honey. Office 612-464-4633. Residence 612-464-7476 — 612-462-4774. Nature's Treat, 6764 W. Bdwy., Forest Lake, MN 55025.

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BEESWAX WANTED — Highest prices paid in cash or trade for bee supplies. The A. I. Root Co., Medina, OH 44256; Council Bluffs, IA 51501; San Antonio, TX 78204. Box 9153.

WRITE FOR SHIPPING TAGS and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25% saving. Walter T. Kelley Co., Clarkson, Ky.

BEESWAX WANTED — Highest prices paid in cash or trade for bee supplies. Dadant & Sons, Inc., Hamilton, Ill. 62341 OR ANY BRANCH. See Dadant ad for addresses.

BEESWAX WANTED — Small lots to truck loads. Write or call. **DONALD SCHMIDT**, 859 W. 9th Street, Winner, S.D. 57580. Ph: 605-842-0350.

WANTED

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

5,000 USED Standard Deep 10-frame supers or 6-5/8 Shallows with or without combs. Write or call: Overbey Apiaries, P.O. Box 656, Bunkie, LA. (318) 346-6433.

WANTED: Approximately 100 queen excluders and 500 supers of any size. Randy Haug, RR1, Box 110, Gary, S.Dak. 605-272-5826.

WANTED-9-5/8 8-frame supers with or without comb in Western U.S. Write: Strachan Apiaries, 2522 Tierra Buena Rd., Yuba City, CA. 95991.

WANTED-Beekeeper Business partner for beekeeping expansion, and queen rearing. More information on request. Write: Jose Maria, MERCADO, U.Loma Hermosa 61-A-301, Irrigacion, Mexico 10, D.F., MEXICO.

HELP WANTED

HELP WANTED: 6 months work in pollen and honey operation in northern British Columbia. Contact: North Peace Apiaries, Ltd., R.R.#1, Fort St. John, B.C.V1J 4M6, Phone: 604-785-4808.

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WORK WANTED by 18 year old student with Western Michigan beekeeper in June, July, August. Experienced one season. Keith Gillette, 967-54th St., Pullman, Michigan 49450. 616-236-6263 after 6 p.m.

ROYAL JELLY

SUPER STRENGTH Royal Jelly capsules, 100 milligrams per bottle of 100, \$12.50; five bottles, \$60. Prairie View Honey, 12303 12th St., Detroit, MI 48206.

PURE FRESH Royal Jelly, 2 oz. bottle, \$19 pp.; 1 lb. \$120. Prairie View Honey, 12303 12th St., Detroit, MI 48206.

POLLEN

FRESH, PURE, Bee Pollen available in 1 pound lots, \$6.50 per pound; 10 pound lots, \$5.90 per pound. Large lots, ask for price. Hubbard Apiaries, Inc., Onsted, Mich. 49265.

FRESH-FROZEN ROCKY MOUNTAIN POLLEN. Highest quality. Post-paid prices: 2 pounds, \$12.00; 5 pounds, \$25.00; 10 pounds \$47.50. Larger quantities, inquire. Cleaned pollen for human consumption, \$1.00 per pound extra. **TETON BEE COMPANY**, Box 176, Victor, Idaho 83455.

O.A.C. POLLEN TRAPS-17.95 ppd. installed, removed in seconds. Average hive tested yields-2 lbs./week. Quantity discounts. Michael Harber, 2835 Emery, Nashville, Tenn. 37214. 615-889-5939.

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HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Iowa 50022.

BEES & QUEENS FOR SALE

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.

So. PA., MD., W. VA., VA. beekeepers; 4-frame nucs with laying queen \$28.50. Live queen guaranteed. 10% to book order. Pickup date approx. April 10 to June 15 at The Honey Bee Farm, Rt. 10, Box 238, Chambersburg, PA 17201. Two miles from Interstate 81. Phone: 717-264-3044.

10-frame single story hives **ITALIAN** bees, young queen colonies in good condition. Pick up dates start mid-April. \$50.00 each. Anderson Apiaries, 115 N. Oak, Adell, Ga. 31620. Ph: 912-896-4419.

QUEENS: DADANT'S STARLINE and **HYBRID ITALIAN**. Bees, nucs and bee supplies for sale. **DIXIE HONEY CO.**, Rt. 1, Box 350, Shallotte, N.C. 28459. Phones: 919-579-6036 & 919-278-6951.

ITALIAN QUEENS-\$5.25. West Georgia Bee Farms, P.O. Box 691, Carrollton, Georgia 30117. PH 404-832-7302.

NORTHERN CALIFORNIA Italian Queens, shipped airmail, postpaid and insured. April 1st to May 15th. 1-25 \$4.50; 26-99 \$4.25; 100 or more \$4.00. After May 15th, 1-25 \$4.00; 26-99 \$3.75; 100 or more \$3.50. Live delivery guaranteed. Ken Bachman (Bachman Apiaries), 1801 Calin Lane, Anderson, Calif. 96007. Phone: 916-365-4029 or 365-4175.

ITALIAN QUEENS AND PACKAGES from April to end of season. Queens 1-5 \$5.00, 6-25 \$4.75, 26-100 \$4.50, over 500 \$4.25. 2 lb. packages w/q \$14.00 plus package. All packages picked up here. John Rickard, Rt. 1, Box 2241, Anderson, Ca. 96007. PH (916) 365-5551, 365-6556.

PELICAN STATE QUEENS "Italian Type Hybrids". 1-5, \$5.50 each - Over 5, \$5.00 each. Postpaid, live delivery guaranteed. Clipped and marked on request. **MAKE OUR QUALITY CONTROL PROGRAM YOURS.** Pelican State Apiaries, P.O. Box 2904, Baton Rouge, LA. 70821. Phone (504) 293-3034 Evenings.

FIVE Frame Nucs available. You haul or we can arrange delivery. Hubbard Apiaries, Box 416, Belleview, Fla. 32620. 904-245-2461.

ITALIAN QUEENS: Fred's Bee Farm, 8015 Sullivan Drive, Charlotte, N.C. 28215. Phone: 704-568-5499. Fred Vees the Man with the Bees.

FOUR frame nucs available April and May \$25.00. possible delivery of large orders. Queens, banded Italian 1-10 \$6.50, 11 up \$6.25. Free marking. Patagonia Apiaries, Box 768, Patagonia, AZ. 85624. 602-394-2448.

PACKAGE BEES, ITALIAN Pick up, Terra Alta. Book early for choice dates. Complete line of bee supplies. James Johnson, Terra Alta (Preston County) WV. 26764. (304) 789-6011.

PENNSYLVANIA DOUBLE GRAFTED ITALIAN QUEENS. Northern, hardy stock. Mating nucs fed Fumidil-B. Book now with payment. Live delivery guaranteed! May to September. 1-5 \$6.00; 6-up \$5.50. Marking .50. James Mentzer, RD 2, New Holland, Penn. 17557. 717-354-8042.

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FIVE-FRAME NUCS in your equipment. Italian bees delivered to Belmont, N.Y. or Florida pick-up. \$35.00 per nuc with \$5.00 deposit per nuc when ordered. Also, 100 single story hives for \$50.00 each. April, May. Dick's Bees, RD#1, Belmont, N.Y. 716-268-7684, if no answer 716-268-5408.

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Alsbrooks Honey Farms.....	263	Garden Way Publishing.....	224	Pantec Development Co.....	220
American Bee Journal.....	271	Genetic Systems, Inc.....	220	Papio Valley Honey.....	225
American Cancer Society.....	224	Gitta Apiaries.....	226	Perrin's Apiaries.....	257
American Racing Pigeon.....	271	Glenn Apiaries.....	264	Petersen Industry, Inc.....	220
American Red Cross.....	262	Glorybee Honey & Supply.....	223	Pierce Mfg., Co.....	221
Apiary Plastics.....	218	Gregg & Son's Honey Bee Farm.....	258	Pierce, Paul W.....	221
Arkansas Apiaries.....	261	Griffin Apiaries.....	260	Plantation Bee Co., Inc.....	266
Arnaba Ltd.....	228	Gulf Coast Bee Co.....	258	Prairie View Honey Co.....	228
Australasian Beekeeper.....	271	Happy Hive.....	227	Queen's Way Apiaries.....	265
Australian Bee Journal.....	271	Hardeman Apiaries.....	261	Root Co., The A.I. 219, 226, Back cover	
B & B Honey Farm.....	260	Harrell & Sons, W.E.....	260	Ross Rounds.....	223
Bee Flat Scale.....	228	Haueter, Rex.....	264	Rossman Apiaries, Inc.....	266
Bee Island Apiaries.....	264	Hel-le Bee Farm.....	261	Rushton Apiaries, Donald E.....	261
Beekeeping Education Service.....	221	High Shoals Apiaries.....	262	Santa Fe Bag Co., Inc.....	218
Bee Supply Co.....	221	Holder Homan Apiaries.....	265	South African Bee Journal.....	271
Bee Wares.....	218	Hubbard Apiaries.....	Inside back cover	Speedy Bee.....	258
Berry & Son, M.C.....	259	Irish Beekeeping.....	271	Stoller Honey Farms, Inc.....	228
British Bee Journal.....	271	Jackson Apiaries.....	264	Stover Apiaries, Inc.....	263
Callahan & Son Bee Farm.....	265	Johnson Co., Carl E.....	221	Strachan Apiaries, Inc.....	263
Calvert Apiaries, Inc.....	261	Jones & Son, Ltd., F.W.....	224	Stubbs Apiaries.....	260
Canadian Beekeeping.....	271	Kelley Co., Walter T.....	272	Sundance Honey Co.....	265
Cary Corp., M.R.....	221	Keyline Inc.....	264	Tate & Son Bee Co., W.L.....	257
Chrysler & Son, W.A.....	221	Leaf Products.....	221	Tollett Apiaries.....	263
Clear Run Apiaries.....	257	Leverette Apiaries, Walter D.....	266	Turner & Son.....	259
Cloverleaf Mfg., Inc.....	221	Maxant Industries.....	224, 228	Vanren Co.....	221
Cook & Beals.....	221	McCary & Son Bee Co., G.D.....	266	Vaughn Apiaries.....	264
Curtis & Sons, Inc., Geo. E.....	266	Miller I. Enterprise.....	223	Venditti, Mike.....	218
Dadant & Sons, Inc. Inside front cover		Millry Bee Co.....	259	Weaver Apiaries.....	264
Daniels & Co., R.C.....	221	Mitchells Apiaries.....	265	Weaver & Sons, Howard.....	258
Desert Honey Co.....	223	Mel Disselkoe Apiaries.....	224	Wicwas Press.....	218
Dixie Honey Co.....	265	New Zealand Beekeeper.....	271	Wildwood Apiaries.....	258
Far West Bee Supply.....	220	Oakley, Jimmie & Kay.....	265	Winona Research.....	218
Floyd's Apiaries.....	260, 263	Ott Honey Farm, Inc.....	264	York Bee Co.....	267
Forbes & Johnston.....	268			Zern Apiaries.....	264

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