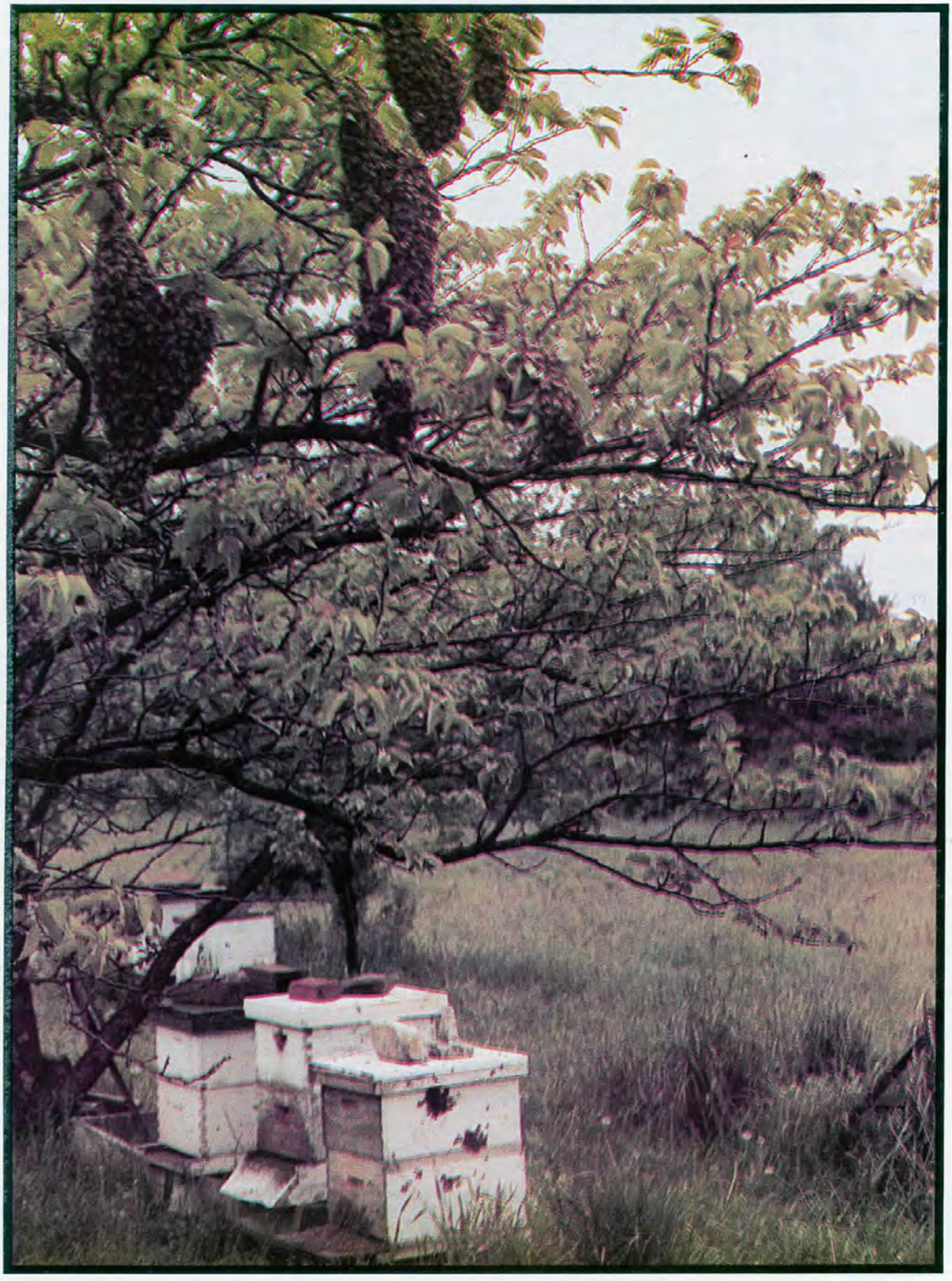
GLEANINGS IN BEE CULTURE

JUNE 1984



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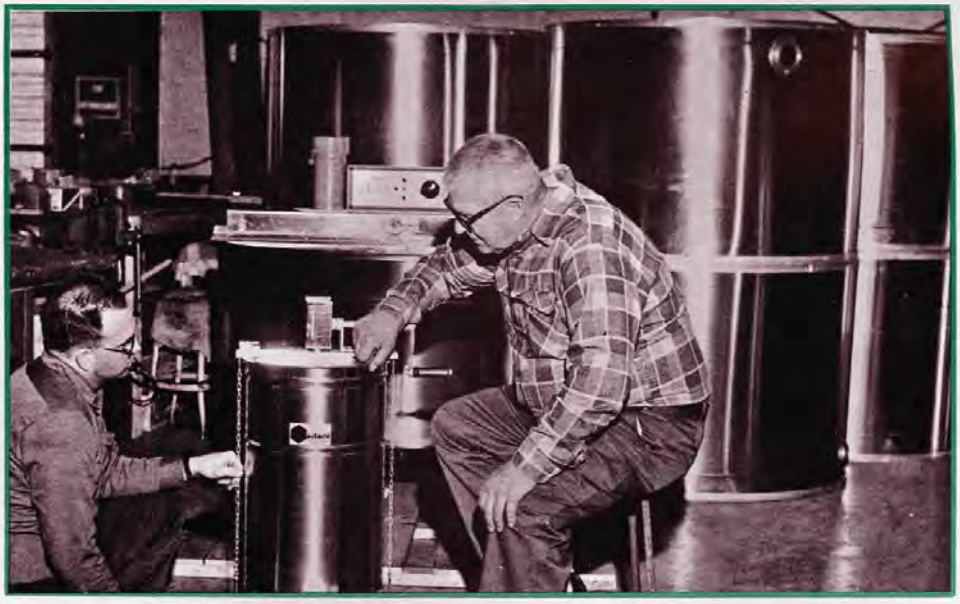

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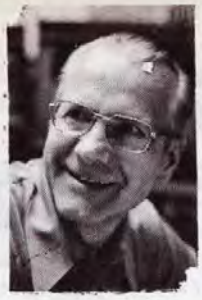

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GLEANINGS IN BEE CULTURE

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CONTENTS

COVER STORY

ANOTHER OF OUR AWARD WINNING PHOTOS, THIS ONE TAKEN BY JOHN ECKROTH OF MEDINA, OHIO!

NOTES FROM THE BEEYARD

by Mark Bruner

THOUGHTS FROM GEORGIA TO OUTER SPACE

We live in a time of contrasts. That's probably rather obvious, but let me be more specific. Several weeks ago I was down south in Georgia visiting with Dr. Al Dietz and the other good folks in Athens and with our friends at Rossman Apiaries in Moultrie. I'll have much more to write about them in the upcoming months, but I'd like now to recall a most interesting and unexpected day at Rossmans'.

That particular morning, I had a pleasant conversation with beekeeper John Gregory from Miami, Florida, about the flight of honeybees aboard the recent space shuttle: STS-13. With his good help, I was able to contact Dr. James Peterson at Honeywell Inc., in Clearwater, Florida. That company was responsible for sponsorship of the "Shuttle Student Involvement Project (SSIP) Experiment" which involved this particular study involving honeybees. At the proposal of student Dan M. Poskevich of Waverly, Tennessee, an enclosure of approximately 3300 Italian worker bees and a queen, provided by Coplin Bee Farms in Arcadia, Texas, were sent into space aboard the shuttle for the objective of determining whether or not bees would built honeycomb in conditions of zero gravity and, if so, how it compared with that built under normal earthbound conditions. A control group of bees of the same number was housed in a similar enclosure on earth.

THE RESULTS. Although it appeared that comb, built by the space bees, was a bit disorganized at first, the bees did regain their orientation, despite zero gravity, and built 30½ square inches of comb during the seven day flight. Their queen issued 35 eggs. The bees were fed a diet of 50/50 sugar and water into which agaragar (a product made from seaweed) was introduced for the purposes of gelatination. The bees returned to earth in good condition with apparently viable brood and constructed comb. The space comb is currently being compared in more detail to that built in the control colony left on earth. The entire project cost between $30,000 and 50,000 dollars.

I'm curious to hear what folks have to say about the experiment. I suspect that there are those who'll wonder aloud about what value comes from knowing that bees can do, at zero gravity, at least some of the things they can on earth. That's a legitimate wonderment, as are a number of the questions pertaining to a space program that costs billions at the same time when similar amounts certainly have numerous valuable uses closer to home. And yet, as I've expressed in previous editorials, the human inclination to experiment and our willingness to take risks, is such a vital dimension of our character that one cannot underplay the significance of what stands to be learned by even the most unlikely or deceptively simple project. This is, perhaps, no more true than in our study of the vast insect world in which our knowledge of why nature functions as it does, is so very far from reaching any semblence of completeness. We have long marveled at the extraordinary engineering capability of honeybees. Similarily, our fascination with the instinctual and social behaviors of nature's other creatures, have frequently contributed to our understand of ourselves and served to enhance our sciences, medicines, command of physics and, certainly, our cultural depth. In that light, it is far from frivolous to seek the answers to speculative questions about how life behavior is influenced by radical environmental changes. Furthermore, in this case, the question was posed by a student -- a sear-

Preparing the Bee Enclosure Module for take-off in the Space shuttle. Mel Coplin (R), Dan Poskevich (L).

ching mind that is young and in need of attention and tools with which to work. From the standpoint of those in the beekeeping world, the visible craftsmanship of honeybees, displayed by the international media, can only serve to magnify the fact that we are concerned with and appreciative of the amazing qualities of a most remarkable insect.

So, that's how I spent my morning -- learning about bees in outer space. Almost as if by design to draw my attention back to earth and the problems of doing things in human fashion, a call at noontime of that same day to Rossmans', from the Georgia State Patrol, brought news that a truck, carrying 550 packages of bees for THE GREAT AMERICAN HONEY COMPANY, bound for Wisconsin from Florida, had been forced off Interstate 75, and had lost its load. We had succeeded in sending bees into outer space, but had failed to ship them across a few states. It is interesting to speculate that, had the space shuttle encountered problems, NASA would have been capable of offering a myriad of routines designed to circumvent catastrophe. On the other hand, a load of bees had spilled on a highway and Georgia officialdom was at a loss for a possible solution. In fact, the truck's driver, himself, was not a beekeeper, carried no veil, and was forced to take refuge at a nearby motel to wait for help. Fortunately, Rossmans were nearby, and several passing beekeepers stopped to offer a helping hand. The entire experience more than completely jerked my mind back to earth and planted my feet firmly on the ground where dozens of confused bees proceeded to hamper my tango dancing abilities by warring on my ankles. In an odd way, however, I'm glad the incident happened -- not for the poor bees, or the poor beekeepers, or for the competent crew of men from Rossmans' who put in many long hours after an already long day to help a fellow beekeeper in distress -- but I'm glad that now, much more so than before, I can tell others things they might do to lessen the effects of a bad situation.

1. An obvious first step is to analyze the situation. If you are at the accident location, that is made somewhat easier. If, however, you are called to lend assistance, write down the exact location. Learn as many details as possible about what has happened. Did the accident involve packages or hives? Is the location urban, suburban or rural? How many others are on hand to help? What has been done to correct the problem --- what is being considered? At this point, it may actually be necessary to explain bee behavior to the authorities. State troopers and/or city officials may have no experience in such matters and may be prone to destroying the bees regardless of whether or not an immediate danger to people is present.

2. Prepare yourself by gathering together as much equipment as is possible to bring with you. You can bet that there will not otherwise be adequate accesories to equip everyone who is on hand to help. Of first order importance: veils, gloves, empty bee package cages, funnel or cardboard to make funnels for the purpose of dumping bees back into packages, empty hive bodies, covers and bottom boards; hammer and an assortment of nails (and/or a good staple gun).

3. Contact or have someone else contact as many local beekeepers as possible. Local organizations should keep lists that are given to each member for swarm calls or emergencies. Give others exact details and request they bring what equipment they can. If a commercial bee operation is within 50 miles, call them -- they are often better equiped to help with crews and equipment. Perhaps they won't be able to get there as quickly, but I suspect most will do their best. As for your part, get to the scene as soon as you can while still allowing time to prepare yourself. Obviously, having beekeepers on the scene will help reduce panic and impulse actions by authorities. Also, although you may not be able to complete much of your work until darkness when bees do not fly, there is much that can be done, before then, organizing and helping bees to survive.

Top photo shows part of the wreckage. Bottom photo gives a view from above after some salvaging and ordering had been done.

4. Protect yourself. Even experienced beekeepers should not underestimate the capabilities of thousands of crawling, flying confused bees. Moreover, at a time of cleanup, speed may be a requirement surpassing normally cautious bee handling.

5. Begin work by categorizing the damaged and undamaged material. Woodenware or packages that are not damaged should be set aside in one place. Partially damaged material that can be fixed with a few nails or staples should be set aside in a second location. Equipment or packages that are damaged beyond a quick fix but still have a moderate to significant amount of bees with them should, if possible, be placed on a surface, such as boards, plywood pieces, etc., that can be picked up with a number of broken pieces and bees piled on top. When it becomes necessary to repackage bees that will make the process quicker than were one to pick the scattered pieces and bee clumps up one by one. Empty and wrecked material should be discarded in an area where it is easy to remove.

6. Bees will be everywhere. In the case of wrecked packages, it is likely that queen cages will be seperated from the package cages. Consequently, as one sorts through damaged material, queen cages that are apart from their colonies should be gathered in one place. This serves three purposes. First, bees will congreagate around the queens, thereby reducing the many random groups of bees scattered here and there. Secondly, this gathering of bees will help insure that the queens are cared for and kept warm. Thirdly, when repackaging takes place, queens are conveniently in one place.

7. Although you may be the honeybee authority on hand,

Continued on next page

remember that you are not the law, nor are you in a position to order others about. A clean-up operation has to be a cooperative effort. Do your best to help by suggesting procedures, but do not create a quarrelsome environment even when you suspect something is being done wrong. Express your opinion. If you are right, people will probably realize it very quickly. Recognize that other beekeepers on the scene may be experienced, too. Discuss things, consider options before assuming and insisting that one way is right and another is wrong.

8. Expect the media to be present. A bee spill makes good news for the newspapers and T.V. It makes bad news for beekeepers. You can help by explaining that these occurances are rare and that, when they do happen, they almost always can be controled without danger to people. Your confidence and professionalism is very important to assuring the public. Any eagerness to brag about what you endured to clean up a mass of stinging, angry insects, will only serve to frighten others and fuel the many misconceptions about bees.

9. As a beekeeper, help inform others as to what they might do if called upon to help clean up an accident. Additionally, assist others in learning the proper ways to tie down a load of bees being transported. For tips on this, see P.F. Thurber's excellent articles on loading and moving bees, presented in the January through May, 1983 issues of *GLEANINGS IN BEE CULTURE*.

Obviously, others who have shared this type of experience can add additional tips. I welcome that. Perhaps we should work toward an ACCIDENT ACTION LIST that could be made available to all interested beekeepers and organizations.

THE EDB PROBLEM DEEPENS

Several months ago, as most of you know, the Environmental Protection Agency banned the use of Etheylene dibromide (EDB) for use as an insect fumigant in stored wheat and grain crops, because of its cancer causing danger to humans. At that time, certain food products were pulled from grocery store shelves because their ingredients contained in excess of the EPA's 30 parts per billion maximum for the presence of EDB in processed food.

Several days ago, the mail brought very disquieting news. The Chemical Residue Laboratory, Florida Department of Agriculture, had issued a report on their analysis of 17 honey samples including brands processed or packed in five different states. All samples had moved through normal marketing channels, the next step of which would have been purchase by consumers. In two cases, the actual EDB residue found exceeded the federal maximum: one was 44 parts per billion; another 99.9 parts per billion. The upshot of these findings is that other State food laboratories are now likely to inspect honey for evidence of this substance.

For an industry whose efforts to market honey have been hampered by disorganization, imports, lack of creative promotion and the botulism scare, this is far from being good news. From time to time, we receive letters from readers asking why we even report such potentially negative things. The answer may not be easy to swallow, but it is factual: nothing is more costly than not knowing. Problems do not often go away if simply ignored. Rather, let's accept facts and discuss ways by which we can deal with this information, especially when talking with non-beekeepers. For example: what would you reply to someone who might ask: "I hear there has been EDB found in honey -- how do I know the honey I buy from you, or from the store, is safe?"

1. Presumably, but probably not exclusively, EDB is transfered to honey through its application to combs in fumigation against wax moths. Obviously, a beekeeper who uses a form of wax moth control other than EDB could make that claim as a way by which to ease a consumer's mind.

2. With EPA restrictions on the application of EDB in many of its former uses, the residual problem, by virtue of restricted, reduced and otherwise monitored use, will naturally decline.

3. Food laboratories routinely inspect honey samples for adulteration. It is likely that the Florida EDB analysis will cause other labs to include, in their studies, inspection for EDB levels on a regular basis. This process, as well as facts stated in point two, above, greatly reduce the likelihood of EDB, in unsafe levels, being found in honey reaching stores.

4. It should also be remembered that the EDB, found exceeding the maximum in the Florida analysis, was present in only 2 of the 17 samples tested. That fact should be kept in perspective as evidence that this is a problem of concern, but not one of crisis proportions.

As always, any commentary of this subject is welcome from our readers.

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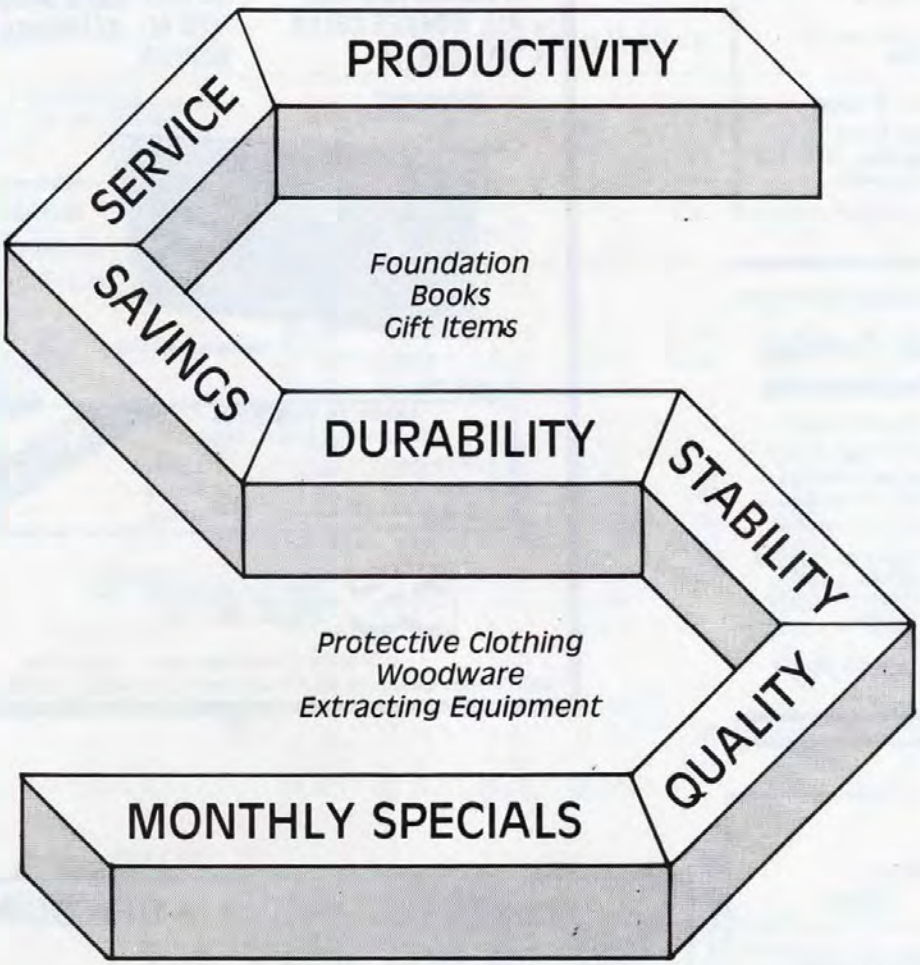

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The Monthly Honey Report

May 10, 1984

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

Wholesale Extracted — **Reporting Regions**

Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	9
60 lbs. (per can) White	42.00	43.00	42.50			39.00	35.00	34.50	37.00
60 lbs. (per can) Amber	39.00	38.00	40.00			36.00	32.10	32.50	35.00
55 gal. drum (per lb.) White		.54	.57	.58			.56	.56	.58
55 gal. drum (per lb.) Amber		.45	.53				.49	.55	.54
Case lots — Wholesale									
1 lb. jar (case of 24)	28.50	24.90	26.60	25.92	38.40	24.25	23.50	26.50	28.96
2 lb. jar (case of 12)	27.50	23.30	24.20	23.76	34.80	23.50	23.00	24.75	26.20
5 lb. jar (case of 6)	30.00	27.80	26.40	23.04		25.50	24.00	25.75	28.00
Retail Honey Prices									
½ lb.	.90		.90	.84		.90	.85	.85	.94
12 oz. Squeeze Bottle	1.50	1.19	1.40	1.25	1.75	1.35	1.25	1.20	1.30
1 lb.	1.50	1.29	1.55	1.50	1.85	1.55	1.29	1.60	1.55
2 lb.	2.70	2.59	2.70	2.65	3.55	2.60		2.65	2.65
2½ lb.	3.35	4.30		3.27	4.60	3.25		3.25	3.50
3 lb.	4.00		3.49	3.87	4.98	3.85	3.75	3.75	3.70
4 lb.	5.00	4.95		4.99		4.90	4.50	4.75	
5 lb.	6.00		6.10	5.90		5.80	5.40	5.50	6.00
1 lb. Creamed			1.55					1.45	1.50
1 lb. Comb	2.25	1.95	2.75		1.95	1.85	1.89	1.70	2.25
Round Plastic Comb	1.75	1.75	1.65	1.69			1.75	1.75	1.65
Beeswax (Light)	1.25	1.25	1.40	1.35	1.25	1.35	1.27	1.15	1.20
Beeswax (Dark)	1.20	1.20	1.15		1.15	1.25	1.10	1.09	1.12
Pollination Fee (Ave. Per Colony)	24.00	22.00	21.00	18.00			23.00	19.00	21.00

MISCELLANEOUS COMMENTS:

REGION ONE

Feeding was in order with most bees in good condition and brood rearing starting early. Everything points to a good year at this time. Honey sales have improved a little, perhaps because so many beekeepers sold to the government and have none or little left for sale.

REGION TWO

Inclement weather first part of April -- delayed bloom. Last 3 days good and bloom looks good for a heavy flow. Bees boiling over. Heavy feeding. Swarming season promises to be strong. Honey sales only fair.

Only one day of pollen gathering so far.

Late spring in Wisconsin. Winter losses higher than average. Put out packages on 19th. Snow on the 23rd.

REGION THREE

Feeding necessary due to late spring. Colonies confined with few foraging days. Many beekeepers quitting but a comparable amount also starting. Ample moisture. Colonies being moved to orchards for pollination. Sales remain slow with large stocks on hand.

REGION FOUR

Moisture good in east part of North Dakota, with west a little dry. Planting on schedule. Receiving stations for honey are preparing for deliveries of loan honey being turned in for payment. One packer in Central N.D. recently packed more than 2 million pounds of honey in a month for government contracts. Winter losses in Minnesota reported at about 10 percent. Windy alot of this spring, but pollen is coming in. Colonies building but stores down. Honey sales slow but not unusual for this time of year.

REGION FIVE

Winter persisted until late April. Then rains took over. Many fruit trees showing winter kill with no evident bloom. Much feeding being done. Market mostly slow. Packers still blending American and foreign honey and marketing it as American. Queen rear-

Continued on next page

MONTHLY HONEY REPORT (Continued)

ing way behind because of wet weather. Some small swarms reported. Poplar flow still 2 - 3 weeks to go.

REGION SIX

Cool and wet with a warm-up in late April. Good build-up. Dandelion and maple helped. Light swarming so far in Kentucky. Heavy in Tennessee. Disappointing honey sales. Little change in prices.

REGION SEVEN

Weather at last cooperating with bees. First flight at daylight: April 26 and 27. A few swarms reported. Season about 2 - 2½ weeks late. Plenty of moisture in East Central Oklahoma. Honey sales slow. Have heard no calls for pollination. Texas reports dry conditions except for the east. Mesquite bloom best in 10 years. Huajillo and horsemint did not produce. Some feeding. Honey sales fair. Crude beeswax still in ample supply. Sales of packages and queens very good. Chinese Tallow trees showing some damage from winter. Little local honey available. No country of origin labels yet.

REGION EIGHT

Montana moisture conditions improved. Dandelion and fruit trees bloomed mid-April, about a week behind 1983. Good build-up with prospects for good honey flow. Near record drought in Arizona may affect summer flows. Retail sales fair.

REGION NINE

Mild temperature first half of April made for exceptionally good queen mating weather in Northern California. Latter part of April was below normal in temp. with strong winds. Northern honey flows above normal in Sierras, as was bear activity. Season ahead of normal there. Moisture pretty good. Bee swarms moderately good. Apple pollination in Watsonville ended April 21. Some vandalism reported. Washington weather windy and cold. Pear and apple pollination through most of April. Sales throughout the region seem fair, with emphasis on light honey.

Beekeeping Technology

By DR. JAMES TEW
The Agricultural Technical Institute
Wooster, Ohio 44691

Beekeeping On A Tricycle

Not quite a year ago several reports appeared in *Gleanings* that described the problems encountered trying to move A.T.I. bees to and from Florida. It may be recalled that the path to the yard was extremely wet, resulting in every vehicle we were using becoming thoroughly stuck.

Photo 1. The Author with that "Boxed-In" feeling.

The A.T.I. beekeeping crew was assured by the land owner that this much wetness had not happened during the last twenty years. Other than difficult access, the yard had many good attributes, and we confidently placed the bees in the same location again. You all know what had to happen — and it did!

The Beekeeping Tricycle

An atypical monsoon season struck the area again. We should have had a premonition back in December, 1983. On an incredibly cold day (approximately 14°F) I could barely fill division board feeders because of a strong frigid north wind that was blowing across the yard. I recall thinking that if it was that cold at our southern winter location, the only other logical thing that would happen would be spring flooding. It did.

I went to Florida in late February to graft 600 queen cells. Upon my arrival at the yard, I found that I was separated from the bee colonies by flowing water (a foot deep in some places) and a thick soupy north Florida mud. Even if we could get to the colonies, a brisk cool wind that was blowing would adversely affect our queen grafting operation. The only consulting to these developments were some unusual contigency plans we had formulated in anticipation of these problems.

I had borrowed a friend's three wheel motorcylce commonly called a "three-wheeler". I really had mixed emotions about this expensive toy, but the machine performed beautifully. We simply unloaded the trailer we were hauling the machine on and attached the same trailer to the "three-wheeler". We loaded all our equipment on the trailer and went for a fast muddy ride across the "north Florida moors"

One piece of equipment that was on the trailer was a large corrugated paper box that had been used to ship a console television. This was the second phase of our unusual solutions to persistent problems. By placing the box on end with its back to the wind, I could sit in the box facing the warm sun and graft larvae quickly.

Eighty percent of my grafts were accepted. I attribute a lot of my early season grafting success to the use of a television box "grafting shack".

The entire migratory process went smoothly this year — thanks to our tricycle all-terrain vehicle and a portable television grafting box. Next year the yard will not be in the same location.□

Bee Talk

By RICHARD TAYLOR
Route 3
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This will be the third and final installment of my description of the shook swarm method of getting comb honey, and the refinements on that system that I've gathered over the years.

Mr. Churchill, it will be recalled from last time, uses the "radical" shock swarm method; that is to say, he shakes **all** the bees from a strong colony into a shallow super containing frames of foundation only. Frames of brood, without bees, are then distributed to other colonies, particularly those in need of a boost. Such radical shook swarming does, without a doubt, achieve the main ingredient of success in comb honey production, namely, powerfully populous colonies.

The same approach is used by Ken and Sherry Nuss, young Iowa beekeepers who have been particularly successful in blending comb honey production into their overall system that is aimed mostly at producing extracted honey. These beekeepers select a warm afternoon to shook swarm twelve to fifteen colonies, getting upwards of a hundred sections from each by the time the honey flow ends three or four weeks later. It is a busy afternoon but after that, they say, there is little to do except harvest the crop. One important variation in their method is that they put a light comb of brood into the newly created shook swarm colony rather than using foundation only, as I have always recommended. Mr. John D. Bacon, a Michigan beekeeper, does the same when raising comb honey by this method. I think they are probably right about this. The presence of that frame of brood prevents the colonies thus created from swarming. When only foundation is used you are apt to find as many as a third of the shook-swarmed colonies swarming back out the next day and thus needing to be hived all over again. And of course the Nusses avoid getting the comb honey travel stained from that brood comb below by selecting a light brood comb, rather than one darkened by many cycles of brood rearing.

Still another refinement on the shook swarm method was provided by Steve Forrest, owner of the Brushy Mountain Bee Farm in North Carolina. Mr. Forrest depends on the sourwood flow, and to get a good crop he finds that his colonies must be extra strong. Here is how he achieved that result in one case: Having three colonies standing side-by-side, he shook swarmed the middle one, only, into a shallow super containing nine frames of foundation, supered it up, and then moved the other two to a new location nearby. The result was that the newly created colony, already strong, gained the field forces of both the other colonies, as these older flying bees returned to their original locations and found no hives there to enter except this one. The fruit of this clever manipulation was five supers of sourwoodhoney in round sections, which is a considerable feat for that particular area.

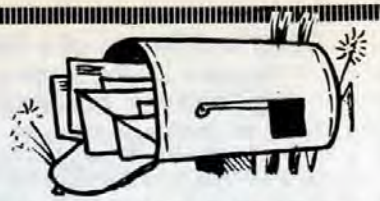
Perhaps the best shook swarm system of all, however, has been devised by Mr. Harrison Ashforth, who is deservedly considered to be one of the ablest beekeepers in the British Isles. Mr. Ashforth radically shook swarms any strong colony he thinks might be inclined to swarm if left unattended; that is, he shakes all the bees from that colony into a new hive (presumably a shallow super) containing only frames of foundation, as previously described. But instead of distributing the leftover combs of brood to weak colonies needing a boost, he does the opposite. That is, he sets the entire hive body full of combs of brood over a **strong** colony, with a queen excluder under that hive body to prevent the queen from entering it from the hive below. This strong colony he appropriately calls the "foster mother" colony. Bees from that colony immediately rise through the excluder to tend the abandoned brood, thereby, incidentally, greatly reducing any tendency on the part of that colony to throw a swarm. Then one week later he removes this box of brood combs, filled with bees and brood, makes sure no queen cells are present, and **reunites** it with the colony that was created by shook swarming. The shook swarm colony, already strong with foraging bees, thus gains back the brood that was temporarily removed, together, of course, with a considerable addition of adult bees.

That system gives Mr. Ashforth really prodigious honey crops, and it is not hard to see why. He notes that an artificially created swarm thus hived on foundation is apt to swarm back out in a day or two, but of course that can be prevented either by using a queen excluder under the shook swarm colony for a few days or, as with the Nusses, leaving one comb of brood with the new colony. Brood always serves as a magnet for bees. Another possible difficulty with the Ashforth system would, I should think, be the danger of the travel stain in the comb honey sections. It is primarily from brood combs, especially old ones, that bees pick up the discoloration that darkens otherwise snow-white sections. Still, this should not be a significant problem if the honey is harvested as soon as it is finished, which should always be the rule with comb honey, no matter what method is used to produce it.

There are some ideas, somewhat tediously described. I'll be trying them all this season, and I'll hope to hear from others as resourceful as the correspondents I have referred to.□

[Readers with questions I ask to make them brief and to the point and enclose a stamped, self-addressed envelope]

Gleanings Mail Box



Dear Editor:

In response to G.W. Hayes, Jr.'s letter in the February 1984 issue of *Gleanings In Bee Culture* magazine.

Mr. Hayes states that we should have breeders in our Northern area to cultivate queens that could stand our harsh weather.

There is a queen breeder in Ohio which I have used the services for the last five years, and which I am greatly satisfied with. And there are probably others that are around the state that are working to give us sturdy and adaptable queens.

My supplier is Glenmont Woods Honey Farm, 6137 Ely Rd., Wooster, Ohio 44691. **Mr. Harvey Hartzler**

Dear Editor:

In your book "*50 Years Among The Bees*" by C.C. Miller on page 89 it shows a picture of coggshell-bee brush. Is that the same plant as Cogswellia or biscuit root? If it is will you kindly tell me if it would grow in Pennsylvania, and from whom I could obtain the seeds. **Walter Hess, R.D. 1, Bainbridge, PA 17502.**

EDITORS NOTE: To be honest, we're not sure. Would you folk's with this book take a look and help Mr. Hess out if you can? Thanks.

Warming Honey Supers

Dear Editor:

I received a letter from Mr. Fletcher F. Miller in Anchorage, Alaska asking about my honey super warming idea which was published in *Gleanings*.

I thought you or your readers might like to see a copy of my answer to him.

Doesn't it sound like a real challenge to keep bees in Alaska? **William A. Gant, 2090 Bauman Rd., Richmond, MI 48062.**

Dear Mr. Miller,

The heat tape I used to warm my stack of filled honey supers is Non-automatic, 12-foot long and made by Wrap-On, Inc., 341 W. Superior, Chicago, Ill. 60610.

The thermostat is also sold by Wrap-On, Inc. It is a #FAD air thermostat with a maximum load capacity of 1000 watts. So almost any length (or even a string of Christmas tree lights) that would use less than 1000 watts or current would work. If the tape were too short, the heat given out would make the time to come to temperature too long. I found even small air leaks increased the time necessary to bring the air temperature up to 100 degrees F.

The thermostat came adjusted to go on at 36 degrees F. and off at 40 degrees F. However it has an adjusting screw. Each one-half turn of the screw clockwise raises the temperature setting by 22 degrees F. I turned the screw a little over one full turn.

To calibrate the thermostat before screwing it to the side of one of the bottom supers, I plugged a short extension cord with a 100-watt light bulb into the thermostat and placed both inside a styrofoam picnic icebox along with a thermometer.

I think I allowed three days in the stack after the dial thermometer (which I pushed thru the styrofoam from the outside) indicated 100 degrees F. I feel all combs were warmed through. Evidently it was like summer inside because, when I opened the stack, I found two small wax worms. Apparently they were incubated from eggs hidden in cracks the bees could not reach. Could it be that the eggs can stand lower temperatures than larvae?

By the way, protect the thermostat from dripping honey.

Last winter I wrapped all my hives with black plastic and put styrofoam sheets between the inner and outer covers. I also put styrofoam on the East, North and West side of some nucleus hives. We had a record-breaking, warm winter. (60 degrees on Christmas and New Year's Day)

This year I was too busy to wrap anything and we had a bitterly cold winter! However I haven't lost many to date. I have upper entrances for ventilation, heavy stores and strong colonies. Many had styrofoam between the covers.

I think the styrofoam promises protection from the cold of winter and the sun's heat in summer. But one problem: the bees like to chew it. They start at the hole in the inner cover and chew right thru a two-inch-thick sheet. (Almost as if they wanted a domed ceiling!)

One winter I lost every one of my five colonies. I believe from inadequate ventilation. I tried to keep them warm by closing them up too tight! There was enough honey left, but combs were mouldy.

Possibly the colonies were too small to winter. I had bought the five hives and we lost some bees moving them by truck to my place.

Since providing an upper, one-inch-diameter hole for ventilation and for an emergency exit, my winter losses have been much lower.

I suspect that hive insulation cannot be overdone, except on the sunny side of the hive where the sun's heat could not get through on a day warm enough for a cleansing flight. I am even considering experimenting with bottom board insulation on the theory that a small amount of radiated heat might be reflected back to the cluster.

William A. Gant

Comments Of Wintering

Dear Editor:

I have just read with interest the letters from James M. Marsh and G.W. Hayes on wintering bees in the February issue of *Gleanings*. Perhaps I may add something on wintering. I am in charge of apiculture, apiary and courses, at MacDonald Collge, McGill University, and have been studying outside wintering for years. At present I am monitoring temperature and studying the ability of clusters to move with various types of winter packing (or none) under varying climatic conditions.

I agree with Mr. Marsh. I discarded the old inner covers long ago. I make my own with a frame the size of a super and screened with 8 mesh to the inch hardware cloth. Mine are double-screened, a screen on each side somewhat like a Snelgrove board. I use them also for moving, double-queening, making top nucs, etc. In one rim is a 2½ x $^{5}/_{16}$" slot. During the active season the inner cover double screen is used with the slot at the top. In the fall I then turn them over so that the slot provides an upper entrance for the bees during winter. It also allows escape of water vapor and carbon dioxide.

The upper entrance makes a great deal of difference in wintering bees at our latitude. Mr. Hayes should not worry about

Continued on next page

cold killing his bees. If they have no disease, enough good stores, a good queen, plenty of bees and an upper entrance they nearly always come through in good condition.

It is somewhat colder here than in Ohio and I have wintered bees over bad winters with no packing at all, though I do usually use a tar paper wrap. My success will "speak for itself", only two colonies in 25 years. Both losses were due to queen failure, two queens that I should have replaced before trying to winter them. **V.R. Vickery, Macdonald College, 21111 Lakeshore Road, Ste. Anne de Bellevue, Quebec, Canada, H9X 1CO.**

Pollen Gathering Information

Dear Editor:

In "Questions and Answers" (*Gleanings,* February 1984, page 67), R.F. Lightsey asked specific questions about pollen traps: honey loss, pollen value and production, and best types. The responses did not match his queries. I don't think he got his money's worth. Permit me to help out—based upon three year's experience and on NO interest in peddling the pollen pilferers.

(1) **On honey production losses.** Pollen traps should be left off the hive or in open mode during the nectar flow which in this area of Central Maryland, 15 miles west of Baltimore, from the ides of May until the calends of June. If one still dislikes keeping a trap on at all times (as I do), the entrance-mounted trap, NOT REQUIRING HIVE BREAKDOWN, is the way to go, although admittedly its capacity is small. Hence, the problem solves itself. (My landingboard lip equals: mounted plastic trap, costing only $10 including shipping in 1982, can be purchased from Korea Beekeeping Apiary, 1155-1 Soong In-Dong, Congro-Ku, Seoul, Korea, telephone 94-0063. [See regular ad in ABJ.] If one believes in parochialism—buying American only—Drapers, SuperBee, Millerton, Penna. 16936, sells an entrance trap, with which I've had not experience, for about $20, as does Root.)

(2) **Value of pollen versus that of honey.** The formers sells anywhere from $8.50 a pound (postpaid—from bee magazine advertising)) to $11.99 for eight ounces in the local Honeycomb retail outlet. I myself sold mine (dried, not fresh) for between $6 and $8 a pound from my home via roadside advertising, but am thinking of moving to the $10 plateau because of sneaking inflation.

(3) **Best type of trap to use** (or how to make instant enemies among the manufacturers): Speaking before the Eastern Apicultural Society (EAS) in Morgantown, W.Va., 1982 EAS masterbeekeeper Ernest Miner, Walkersville, MD., mentioned 14 pollen traps, eight of which he evaluated on performance (this I can vouch for since, unbeknownst to him, I inspected his set-up one day). The first and only printed report I have seen in this field, it rates only two "good," both bottom-mounted (placed between bottom board and brood chamber), unlike my entrance trap. They are the Modified O(ntario A(gricultural) C(ollege), Honeybee Products, Amery, Wisc. 54001, $19.95 plus shipping (also offered by Root dealers) and the "Very-Clean," Cloverleaf Mfg., Denver, Colo. 80204, $32.50 postpaid (also sold by Dadant dealers). The highly-touted C.C. Pollen "super trap," which I have just begun to use—a gift from the foremost bee trivia collector from Richmond, Kentucky (see his series of articles in ABJ, October 1983-March 1984)—and which sells for more than $30 (current price not listed in bee journals) was not tested.

(4) **Average yield per colony.** With my small plastic Korean entrance-mounted trap, I collected 13 (yes, 13) pounds of pollen between March and October (less May and June) 1983. Its small capacity of about six ounces prevented a larger collection on two or three days only.) Based upon my experience last month (February 1984) with the C.C. Pollen trap which yielded nine ounces in one day (after drying), the prospects look much brighter; however, since that harvest until today (March 7), the collections have been five pollen grains because of cold weather and rain.

My recommendation—for what it's worth—is to start with the least expensive trap on the market and then decide on one's future course, after a year of experience. Also I would think that the bee journals would perform a real public apian service by publishing the Miner findings. **J. Iannuzzi, RFD 4, Ellicott City, MD 21043.**

Wax Moth As Friend Of The Beekeeper?

Dear Editor:

"Gentlemen, I believe that the wax moth is one of the beekeeper's best friends".

At this point, I duck to avoid being hit by flying hive tools, lifters, inner covers and smokers. After the initial barrage, I raise my voice and repeat "Gentlemen! Have you ever" — and a voice breaks in "Have **you** ever opened a weak hive and found that the web-spinners have been working overtime?" "They tied up one of my hives so bad, that I had to cut it out with a shovel." Another voice said. "He must be a fisherman!" "No!", said a third, "He's a hobby beekeeper who has a single strong hive and has never seen wax moths." "Gentlemen!" I repeated, "Hear me out, please. You know and I know that a lot of our disease problems come from wild hives, those that live in bee trees and buildings. As the disease takes its toll of the inhabitants, the hive becomes weaker and weaker. The moths move in and begin their work. So, by the time that the disease has wiped out the colony, the moths are well along in their efforts of making sure that no other swarm moves in to the disease ridden home." **Bob Neumann & Al Switzer of Miami County (Ohio) Beekeepers Association, 183 South Dorset Rd., Troy, OH 45373.**

Queen Introduction Information

Dear Editor:

In the February 1984 issue of *Gleanings,* Mr. P.F. Thurber mentioned our article on queen introduction published March-October 1971 in *The American Bee Journal.* We have a 13 page reprint available for $1.00 postpaid; quantity discount. **T.S.K. Johansson, R.D. 1, Box 256A, East Berne, N.Y. 12059.**

Oops

Dear Editor:

I expect to find a correction in one of your next issues of *Gleanings* regarding a very unfortunate printing error on page 100, February, last paragraph of 'Siftings'. The word 'sugar' is used instead of 'honey'.

'Siftings' and 'Bee Talk' are still my favorites. **Kurt Streckeisen, Box 4181, Station E, Ottawa, Ontario K1S 5B2, Canada.**

COUNTRY OF ORIGIN LABELING REGULATION

Many of you have contacted us asking where you can write to give your support to the Customs regulation stipulating that imported honey and foreign honey blended with domestic honey, must carry a label citing country of origin. Below is one such address:

Donald Lewis, Director/Entry Procedures and Penalties Division -- U.S. Customs. 1301 Constitution Ave., Washinton, D.C. 20229

Testing Your Beekeeping Knowledge

By CLARENCE H. COLLISON
Extension Entomologist The Pennsylvania State University University Park, PA 16802

Last month the test was concerned specifically with bee behavior, a topic that I suspect was difficult for many of you. This month, therefore, we are going back to the area of basic beekeeping. Experienced beekeepers not only must know their subject well to be successful, but are also called upon regularly by the general public and beginners for help and information. Even though there are many different ways of accomplishing the same task in beekeeping, dissemination of correct information is important to the well being of our industry. To be a good teacher, it is important that we try not to let our personal opinions overshadow the basic concepts. In those controversial areas, it is important that the student be exposed to many different points of view. When there is not a correct answer or you do not know the answer, indicate as such.

This monthly feature is a way of testing and increasing your beekeeping knowledge. Take a few minutes and answer the following questions to find out how well you understand general beekeeping.

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

1. Eggs unfertilized by the queen honey bee become workers.
2. A queen lays continuously throughout the season.
3. More than one swarm may leave a colony during the swarming season.
4. The queen usually begins to lay about one week after her final mating flight.
5. Solid patches of brood indicate the presence of a good queen in a colony.

Multiple Choice Questions (1 point each)

6. _____ The chief value of the beekeeping industry to the U.S. economy is attributed to: A) honey production B) wax production C) pollination of agricultural crops D) venom production E) royal jelly production
7. _____ Packages of honey bees are normally sold in 2,3,4 or 5 pound sizes. A pound of bees is approximately: A) 10,000 bees B) 15,000 beees C) 3,500 bees D) 5,500 bees E) 2,500 bees
8. _____ The most common race or strain of honey bee in the United States is: A) Caucasian B) Carniolan C) Buckfast D) Midnite E) Italian
9. Describe two ways to prevent spoilage in collected pollen after it is removed from pollen traps. (2 points)
10. Name five different forms of honey that are produced and marketed in the United States. (5 points)
11. Name two ways in which the colony uses water. (2 points)
12. Rate of development (egg to adult) in the honey bee colony varies with caste and temperature. Please indicate the total developmental time for the three castes.

Worker _____ days
Drone _____ days
Queen _____ days

Answers to Testing Your Beekeeping Knowledge

1. False When an egg is fertilized, it will develop into a female bee (worker or queen depending on nutrition and care). but if it is not fertilized it becomes male or drone.

2. False Brood production in a honey bee colony is determined to a large degree by local weather conditions, geographical locations, local honey, and pollen flows. As temperatures drop in the fall along with a reduction in pollen and nectar coming into the hive, brood rearing decreases rapidly. The egg laying of the queen tapers off and often stops completely in October, November and December even if pollen is stored in the combs. Under subtropical, tropical and mild winter conditions, egg laying and brood rearing usually never stop.

3. True The primary swarm usually consists of the old queen, a few drones and 50 to 60% of the workers. Occasionally, the other smaller swarms may follow (after-swarms) with a newly emerged virgin queen. Colonies have been known to swarm so many times that they actually swarm themselves to death.

4. False After mating with 7 to 15 drones, the queen returns to the hive and begins to lay in 2 to 5 days time.

5. True Judging queen quality is very difficult for the beekeepr. As a result, they rely heavily on her brood pattern. There are two major qualities to look for: one is the compactness of the brood pattern on each frame and the second is that brood of one age should be adjacent to brood of a similar age.

6. C
7. C
8. E

9. Freshly trapped pollen is perishable and must be either **frozen** or **dried.** Studies at the University of Guelph, Ontario have also shown that mixing 2 parts freshly trapped pollen with 1 part granulated sugar and packing it tightly into sealed containers is an effective way of storing pollen. Pollen stored in this manner does not require refrigeration and can be incorporated readily into pollen supplement formulae. It was found to promote excellent brood rearing after two years' storage at room temperature.

10. Liquid extracted honey
Cut comb honey
Section comb honey
Creamed or finely crystallized honey
Chunk honey

11. Honey bee colonies use water to regulate the temperature (cooling) and maintain optimum humidity within the hive, as a diluent for thick honey, and to liquefy crystallized honey. Water is also needed in their own diet and to raise brood. The water requirement is quite extensive, especially in the spring when a large amount of larval food must be secreted by nurse bees.

12. Worker 21 days, Drone 24 days, Queen 16 days.

There were a possible 20 points in the test today. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying, you will do better in the future.

Number of Points Correct

20-18 Excellent

17-15 Good

14-12 Fair

A Plan For Success

By GLENN GIBSON, President, American Honey Producers Association
P.O. Box 368 Minco, Oklahoma 73059

For three years Secretary of Agriculture John Block has maintained that the support price for honey is too high and has asked the Congress to give him Discretionary authority to implement a program more in line with world markets. Bills have been introduced to give him that authority. We have stoutly maintained that this would be tantamount to killing the program and would result in bankrupting a host of the world's most efficient beekeepers.

If decisions to kill the honey loan program were based on the economic value of honey and beeswax alone, I might be forced to agree with the Secretary; but this is definitely not the case with honey. We feel that the pollination value of the honey bee is still a sound justification for continuing the honey loan program and giving domestically produced honey some protection from imports.

The Congress used the pollination value of the honey bee as justification for public interest when they originally approved the honey loan program in 1949. Our trouble seems to stem from the fact that few outside the bee industry fully understand the pollination story. This means that the Secretary of Agriculture and members of the Congress, who haven't been advised by constituent beekeepers, will likely decide our fate based on the economic value of our honey alone.

Department letters going to beekeepers and members of the Congress reveal little understanding of our industry. For example, the Department has mistakenly concluded that . . .

1. High prices under the honey loan program have resulted in overproduction.
2. Beekeepers can offset market losses with an increase in pollination fees.
3. The price of honey should not be the deciding factor as to the availability of honey bees for pollination.

We have called attention to these errors several times but the replies have skirted the issue. We feel that a clear understanding of each point is necessary before a fair decision can be made, not only on the honey loan program but other programs as well.

It is well known that we have asked the Administration and the Congress to give us some relief from imports. Help could be forthcoming from either agency in the form of direct subsidy, duties and quotas or some special legislation. And this could be implemented without disturbing the honey loan program. Also, some relief would be realized if Japan and the Economic Community (Western Europe) would lower or eliminate their duty on imported honey. We will support any route that will give relief and keep the hard-pressed beekeeper in business.

But nothing favorable will happen unless the pollination story is understood. The degree of understanding among members of the Congress will be in direct relation to the number of letters from constituent beekeepers. I am firmly convinced that we will win or lose on this one point.

A Coherent Pollination Story

Reviewing the comment on honey bee pollination during these last three years tells me that we have done a poor job of telling people where and how bees are used for public benefit. There is a crying need to clarify and update the story. Research has established a value for certain cultivated crop plants, but details about public benefits have been ignored. Also, the honey bee's value to home gardens and wildlife is seldom mentioned.

The Secretary of Agriculture and his economic advisers feel that beekeepers can and should raise their pollination fees to offset losses. This erroneous perception is based on a 1976 study by USDA that said the pollination market was expandable and the user derived more benefits than the beekeeper. An indepth study needs to be made as quickly as possible to determine how many beekeepers rent for cash and how much honey bee pollination is done for free. Also, the study could include some information about the value of honey bees to home gardens and wildlife.

Our continuous reference to multi-billion dollar value of honey bee pollination to the agricultural economy has fuzzed up the pollination story. The bee industry is a valuable asset to the country, but not equal to the value of crops that are pollinated. the current figure of $18.9 billion being bandied about means very little to the average congressman. This is probably a reasonable figure to report the value crops benefited by honey bee pollinatic but in no way does it establish a speci value of honey bee pollination. There is crying need to establish the honey bee value in each state — not only for cultivat crops but home gardens and wildlife well.

Heavier stress needs to be placed what will happen to a given environme when honey bees disappear. I have see a number of general statements on t subject but none referred to a specific are Except in a few areas in the country I wou doubt that anyone would note the loss honey bees. Certainly not the beekeep who moved. Sportsmen wouldn't like note any trouble. A scientist might. Hom gardener's wouldn't. Bee renters growir crops that require honey bee pollinatic would likely note that a problem existe Some of this latter group might switch another crop. Loss of honey bees and the impact on the surrounding communi needs to be studied as soon as possibl Subject study should include gardenin and wildlife.

What You Need To Do

BEEKEEPERS, if you haven't alread done so, please write your two Senato and U.S. Representatives and tell the about the importance of the beekeeping i dustry to agriculture, home gardens an wildlife in your state. If you don't have th information, write to your state Land Gra College and ask them for the informatio In most states this should be sent to th Department of Entomology. If you are su cessful write us, we may have this data our files. Let's be sure our congressme understand the pollination story in their pa ticular bailiwick. We will assist in anywa possible. You need to be a part of th action!!!

Continuing . . . .

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3-6		156-312	$1.22 each	$63.44	$1.02 each	$53.04
7-10		364-520	$1.17 each	$60.84	$0.97 each	$50.44
11-20		572-1040	$1.12 each	$58.24	$0.92 each	$47.84
21-60		1092-3120	$1.09 each	$56.68	$0.89 each	$46.28
61-100		3172-5200	$1.04 each	$54.08	$0.84 each	$43.68
101-200		5252-10400	$1.00 each	$52.00	$0.80 each	$41.60
		10452- up	$0.98 each	$50.96	$0.78 each	$40.56

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PRIMITIVES & COLLECTIBLES

1916 Western Electric year book; 1920 Missouri Ruralist maps of the world, Missouri, U.S.; 1939-40 Sear's — Roebuck & co. catalog; 1939-40 Montgomery Ward's catalog; 1905 leahy Bee Supply Co. catalog; 1919 Root Co. catalog; 1950 & up Bee Supply catalog; 1926 Montgomery Ward Incubator Instruction book; 1928 year appointment book; 1947 Freeman & Roberts Hardware, Lexington, Mo., calendar; Pat. 1890 Lufkin Magic Pattern Rule & Chart; Clipper 36 paper dispenser; Howe Countertop balance scale; All steel parcel post scale; 2 Warm Morning wood stoves; 2 Monkey stoves; Farmers Bank of Higginsville blank checks; Lexington Optical co. eye glasses in case; Bradley stencil machine; 15 Nail kegs; Wood dove-tail boxes, Dutch Boy, National Lead Co.; 2 Pine benches; Underwood typewriter; 2 Wood bench vises; Large lathe tool; Wood tool boxes; Farmstrong dies No. 1 & No. 2½ w/dies; 400 Wood shop boxes.

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Wintering The Honeybee Colony: Part II Preparation Of Hives On Summer Stands

T.S.K. JOHANSSON and M.P. JOHANSSON
Queens College of CUNY, Flushing, NY 11367 and Queensborough Community College of CUNY, Bayside, NY 11364

The Combs

"A clean set of combs, as complete and free from drone-comb as possible, neither too old nor yet too recent."

Dzierzon's opinion that "Bees always winter better in old comb" is incorporated into recent literature on wintering. But Villumstad found no disadvantage for colonies wintered on new combs drawn during the fall feeding. They consumed less food and their bouts with Nosema were less frequent[38]. When the authors undertook a program of harvesting wax rather than honey, the stores left for the bees were often on new combs. A considerable proportion of these were built of drone or storage cells. If possible, we rearranged the combs so that those in the middle of the uppermost hive body were mostly worker cell size for the queen to lay in when brood rearing began in January.

It is also advisable to manipulate combs so that approximately ⅓ of the cells in the two center combs are open so the bees can cluster on them. The cells may contain the last of the sealed brood about to hatch at the end of the season. If combs are completely filled with honey, the bees will cluster below their food supply[39].

The Stores

"A store of honey which will last at least until the following March or April. It is true that a moderately strong stock consumes, when perfectly quiet, not more than about one pound per month. But as the consumption of honey is greater in colder weather, and, again, in more frequent flight of disturbance of other kind, to be on the safe side it is best to reckon twice as much, that is, about 10 pounds from about October to March, and about as much again for the time between March and the next honey-season, which would, perhaps, not set in before June."

Consumption of stores. Braun reported colonies consumed eight pounds from October 1 through February 5 (¾ oz. per day), and 12 pounds from February 5 through March 31 (3 oz. per day) when there was brood. This total of 20 pounds is also what Dzierzon recommended as enough to stretch out until the next honey-season began. In the test Dzierzon indicated there was a nectar flow in April, and he fed any stocks short of stores. That colonies were housed in "Twin-stock" double hives with a thin wall between them eliminated loss of heat from two surfaces, and reduced honey consumption proportionately. Dzierzon also stacked these double hives in three or four layers, reducing heat loss further by as much as 50% for hives in the middle of the stack. Multiple packs of as many as 16 hives have been used in Nova Scotia[40].

Weight losses during the winter months are not as commmonly recorded as gains during nectar flows. Standifer used data collected 1942-1964 by E. Dertel in Louisiana showing average weight losses from November through February totaling 12.1 Kg (26.7 lbs.). Except for one year there was no net gain after September. The losses recorded by J.O. Moffett 1973-1978 in Tucson, Arizona, from almost none to considerable during January through April, were correlated with rain which permitted desert flowers to bloom.[41].

In France, Partiot recorded the winter consumption of colonies 1951-1953, minimum and maximum temperatures, pollen collection, and days of flight. The average loss between October 1 and March was 10.5 pounds. In 1951-1952 temperatures ranged from -5 to 17°C (25 to 63°F)[42]. In cold climates where bees are confined for 5 or 6 months, food consumption is variable. In Alberta outdoor colonies over a 4-year period averaged 39-71 pounds, with a range for individual colonies of as little as 22 pounds and as much as 86 pounds. This agrees with Farrar's average in Wisconsin of 55 pounds with a range of 30-80 pounds[43]. Normally colonies use 1-3 pounds of honey monthly during October through January, but when brood rearing begins in January increasing amounts of honey are required to maintain temperatures of 90°F (reaching ½ pound per day in April)[44].

It is not sufficient to provide the average stores consumed by colonies during the winter since half the colonies will use more than the average. A shortage of one pound will mean the demise of the colony; therefore, the maximum stores used by any colony becomes, in fact, the minimum for all colonies, with a larger mass relative to the cluster surface area for radiation of heat, use less honey per bee during the winter than small colonies with a proportionately larger surface area for radiation. O. Brenner found that while the strongest colonies used 0.3 gram of honey per bee, the weakest used 1.68 gram, or 5.6 tmes as much[45].

Quantity. The question of how much honey to leave for the colony may be answered best with William Blake's definition: "You never know what is enough unless you know what is more than enough". Benton, the first U.S. apiarist, admonished "good food and plenty of it". He considered 40 pounds sufficient for the northern latitudes, and 30 pounds for the middle section; recommending that twice the amount actually consumed was better[46].

Starvation is a major cause of winter loss, and can be avoided by leaving sufficient honey for the colony to consume between the earliest recorded killing frost in the fall and the latest first nectar flow in the spring (an average of 7-9 months in the north, and 4-6 months in the south)[47]. More honey is consumed in milder climates, or when fall and winter temperatures are above normal and bees are more active. In the south bees may be confined for only a few days at a time.

The conscientious beekeeper who attempts to determine how much honey to leave on his colonies is faced with a confusing array of recommended minimum amounts in books and manuals. The origin of the confusion can perhaps be traced back to the primary sources of information published by the influential Demuth and Phillips. They deliberately indicated only half (45 pounds) of the stores required for wintering. Their motivation is not stated, but Phillips admitted he had a bad conscience about doing so: "The time seems to have arrived when we can safely tell the truth about this question, and speak without evasion"[48]. In 1933 the majority of beekeepers had locations where the average annual production of honey was 35 pounds with a range of 13.5 to 105 pounds. North Dakota had an average of 97.4 pounds then and 124 pounds in 1972. If a minimum of 90 pounds of honey is required for successful wintering, few person would be encouraged to keep bees except in prime beekeeping areas where

Continued on next page

the colonies produce appreciably more than 100 pounds. In Nova Scotia an average of 74 pounds of honey is obtained, and colonies are fed 35-40 pounds of sugar syrup. They are also fed in the spring before splitting them for pollination. The practice of packing several hives together has reduced losses due to starvation from 30-50% to 5%[49].

Deficiency. To leave less than adequate stores of honey, and depend upon feeding sugar in the spring, if necessary, may prove disastrous if there is an unusually late, cold spring preventing such feeding. Even in Maryland, Kelley recommended leaving 75 pounds of honey in the fall to avoid the necessity of spring feeding[50]. April 1 through May 15 is a critical period for colony expansion in northern states. If there is less than 15-20 pounds of honey on hand, brood rearing may be reduced and the colony will dwindle. Colonies with less than the equivalent of a shallow super of honey (30-40 pounds), should be given honey from disease free colonies with an excess, or that did not survive the winter.

The cost of losing an overwintered colony is considerable. Not only is there a messy hive to deal with, but a replacement will require the purchase of a package or nucleus and sugar for feeding. Producing a nucleus by removing bees, brood, honey, and pollen from overwintered colonies will reduce the potential for growth of the colonies so deprived. Loss of selected stock is also a consideration.

Excess. Some colonies use very small amounts of honey in some winters, and extremely large quantities during some very long, cold winters. When the beekeeper prepares his bees for winter, he should imagine he is packing supplies for himself to last a winter at an observation post in Antarctic. Bees do not use food they do not need, but an excess is insurance against the year with a "worst winter ever" scenario when replacements do not arrive as expected. There are also exceptional years in southern states when bees can fly but it is too cold for nectar secretion. In Texas colonies used 40 pounds of honey between December 1 and February 1 and then required feeding until April, and again in June when it was cold and rainy. Even 60 pounds might have been inadequate[51].

To be a successful beekeeper, it is necessary first to be generous with the bees, leaving them an excess of honey. Colonies consuming the most honey produce the most surplus. The honey also serves as a heat reservoir to buffer temperature fluctuations in the hive[52]. Any combs of honey not needed can be given to colonies that require additional honey, or to establish new colonies in the spring. Many wintering troubles would disappear if sufficient honey were left to provide feed for the unusual season[53].

Providing space. The term "hive" has usually meant a single chamber in which to house a colony of bees. Additional room added during the nectar flow to secure a crop of honey was removed in autumn, leaving the colony whatever honey remained in the single hive body or brood chamber. A queen excluder placed on the brood chamber prevented the queen from laying eggs in the honey supers. The practice of top supering the last two weeks of the season to crowd honey stores into the brood nest may restrict brood rearing unduly.

The development of hives in Eastern Europe produced a wide assortment of sizes, including some with the largest frames ever used (23″ x 23″). More important was the tradition of leaving honey in sufficient quantities to last until the next harvest[54]. The A.I. Root Company introduced the American food chamber hive in 1923, using a shallow super as a permanent part of the Langstroth hive to avoid the necessity of feeding the colony at the end of the season. In 1978 some commercial beekeepers were returning to such 1½ story hives with the shallow hive body on the bottom, an upper entrance, and a Celotex (wallboard) inner cover[55].

In 1954 a full depth ($9^5/_8$″) hive body was promoted by the Roots for the food chamber and as a second brood chamber when the colony expanded in the spring. Cale suggested adding a shallow to two deep Modified Dadant hive bodies to ensure adequate room for brood rearing and winter stores[56].

A 2-story Langstroth depth hive provides approximately 60 pounds of honey, and may require that additional food be fed to the colony in the spring. In Wisconsin Farrar recommended a 3-story hive be used with at least 90 pounds of honey, and in Alberta Szabo suggested 100-200 pounds[57]. The authors winter in two deep and two shallow hive bodies, making it less onerous to lift off the top bodies to inspect brood and check whether additional space is needed in the spring and summer.

Estimating stores. Michaelmas (September 29) was the traditional time to weigh skeps. Although experienced beekeepers may "heft" a hive by raising one end to estimate whether there are sufficient stores, the use of the scale is preferable[58]. The authors hook a spring scale under one side of the floor board and tilt the hive to determine half its own weight. Doubling this scale reading, and subtracting the weight of the equipment provides an estimate of the stores. It will be inaccurate to the extent that the honey may be distributed unequally. Weighing each side and adding the two half weights together may improve accuracy sufficiently to warrant the effort. Various devices used to weigh the entire hive, including tripods and a small crane mounted on a truck, make weighing easier and more accurate[59].

The gross weight of stocks in 2-story 9½″ hive bodies (plus a cover and bottom) should be 120-130 pounds to contain 60 pounds of stores and 140-150 pounds to contain 80 pounds. A 3-story hive weighing 175-180 pounds will contain 90 pounds of stores. An estimate of stores can also be made by inspecting the hive and allowing a weight of five pounds for fully capped deep (9½″) combs, and 2½ pounds for shallow combs. Unsealed honey will be used up before winter and can be ignored in the estimation.

Distribution. Although a colony may have a sufficient quantity of stores, it is important that the honey be located so it will last through continuous cold spells when bees cannot move to recluster (an average of 3-4 months in the north and as much as 5 months in Thunderbay, Ontario). Combs of capped honey should be arranged compactly along both sides and above the cluster rather than scattered throughout the hive. The cluster moves gradually onto combs of honey just above them. When temperatures permit, bees may move honey from more remote locations into the cluster area.

Colonies that consume all the honey within reach are found dead in the spring with most of their honey stores unused. Such coincidences can be prevented only by opening the hive in January and February, and placing combs of honey in place of empty ones next to the cluster. Such a maneuver once considered ill-advised is now recommended as the only option to prevent the loss of colonies. In some regions there are periods when such an examination can be undertaken safely. The prarie states are favored with chinook winds during which time the bees can fly and recluster on other combs of honey. The January thaws of the middle west are legendary. Quinby suggested bringing the hives into a warm room to allow the bees to recluster.

Removing surplus. Where the major source of honey is provided by fruit bloom and legumes, beekeepers usually remove and extract supers of honey during June and July; leaving 40-60 pounds for the bees' use during the rest of the summer and fall[60]. In areas where surplus is produced from fall flowers, the honey cannot be removed until September, or later, if it is to be nearly completely capped.

Quinby circumvented many of the difficulties by removing combs of honey as soon as the bees started capping them, and finished concentrating the mostly uncapped honey in an evaporator until it weighed 12 pounds to the gallon. This technique has been revived recently by beekeepers in Nippawan, Canada as a means of competing with cheaper imported honey. Not only is the troublesome task of separating wax cappings from the honey eliminated, but there is also a 20-40% increase in production. Dehumidifiers remove 2-4% of the moisture in a 24 hour period[61].

Quality. Apparently any ripened honey is satisfactory for wintering, except for honeydew (collected from the exudate of insects) or honey containing high ash content during long, hard winters when bees cannot fly to defecate[62]. Some honeys, such as from asters, tend to granulate quickly and have been considered unsuitable as winter stores. When Farrar substituted granulated honey for the liquid stores of three colonies they showed no ill effects, and only a small quantity of crystals were found on the bottom boards[63]. Crystallized rapeseed honey proved disastrous for colonies wintered indoors unless provided with water for reliquefaction[64].

Honey or sugar syrup acquired too late to be properly ripened may cause problems due to the yeast fermentation of such low concentrations of sugar. Overloading the rectum and toxic effects may result in the destruction of the colony[65]. Infection by a soil and water bacterium causes sugar syrup to become thick and stringy, as well as splitting off fructose which is fermented by yeast into lactic acid[66].

Feeding sugar syrup. Beekeepers who use honey supers equipped with nine instead of 10 frames cannot use them for winter stores because when the queen excluder is removed, the queen will lay eggs in the combs and the bees will build comb in the spaces between the combs. After the honey supers are removed, it is necessary to feed the colony unless the brood chambers contain sufficient honey. Harvesting most of the honey and feeding cheaper sugar is done on a regular basis in Europe where the average crop is small, and the price of honey is proportionately much higher than of sugar. An analysis should be made to determine whether the effort is cost effective in each situation[67].

The best concentration of sugar syrup for feeding seems to be 60-65% (2 white granulated sugar: 1 water (by weight) = 67%). Reducing the concentration of the sugar slightly to 64% will delay the onset of granulation; even at temperatures as low as 32°F. Liquid sugar containing a small percentage of inverted sugar avoids the work of making sugar syrup. Since inversion of sugar by bees reduces their life span by 24.6%, high fructose corn syrup (HFCS or isomerized syrup), already inverted, is an ideal feed where it is available to beekeepers. The honey sacs of autumn-emerged bees are larger, and they take larger loads when the syrup is thick rather than thin; beyond 70% the loads decrease[68].

Colonies should be fed as soon as possible after frost to provide the maximum time for evaporating, inverting (ripening), and capping the syrup. Bees collect syrup only when the nectar flow has ceased, and brood rearing should be reduced or over by then.

As feeding changes the bees' behavior so robbers are able to enter without challenge, it is best to feed the stronger colonies; taking combs from them for weak colonies. Feeding early or late in the day may reduce the danger of robbing. An outdoor feeder containing a weak syrup (5-10%) to create an artificial nectar flow may circumvent problems from robbing under difficult conditions[69].

Some beekeepers routinely feed 10-15 pounds of sugar syrup after the active season whether the bees need it or not. The bees place this syrup in the empty cells of the brood nest where it is available during the coldest part of the winter. The purprated advantage is that the sugar produces no residues and postpones the need for a cleansing flight until it is warmer. The honey will the be used for rearing brood[70].

Otherwise normal, weaker colonies can be given combs of honey from stronger colonies that are able to process larger quantities of syrup. If partial combs of disease free honey are to be fed, they should be uncapped and placed underneath the brood nest where the bees will move the honey up into the brood nest. In the fall bees do not bring honey down from above the brood nest[71].

Colonies that do not collect syrup readily have been used as a quick selective device to detect colonies as likely to need requeening. In seven years 10% of the colonies fed were discovered to require requeening[72].

To Be Continued Next Month with features in feeders, antibiotics, pollen, hive location and special problems.

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IT PAYS TO KNOW

How to . . .

By P.F. THURBER
5522 127th Ave. N.E.
Kirkland, WA 98033

A Loading Pole Light

Why anyone loads beehives and moves them and then unloads them at night, I do not quite know. This business of turning an ankle and then having to work for perhaps a good many hours while in pain is for the birds. Anyway it is unnecessary because there is a way to move bees in daytime without leaving field bees behind. If someone twists my arm I will write about it. Meanwhile there are people who like to do things the hard way so let me present a gadget which I think helps during night loading and unloading.

Although I had tried to make do with gas lanterns and flashlights and certainly they give enough light, I had not been happy because first I did not want to set a gas lantern on the roof of the cab because of the fire hazard if it was knocked off, (also gas mantels are delicate) and second the higher the light source within reason the better you can see depths of depressions in the land on which you are working at night. When finally I did in fact turn an ankle (and darn near broke it) I got off my tail and went shopping. I prowled around looking for something cheap. Hardware stores did not unearth anything neither did an electric wholesaler, but in an aircraft salvage shop I lucked out with the light fixture shown. Since it only cost me a quart of honey I did not make a fixture, but with a 10 ounce canning jar and lid and a socket from the tail light from a wrecked vehicle, you could fashioned one. Obviously you could make up something just as good in perhaps an hour.

Close-up of pole light and spike. I put an aluminum foil reflector to throw light.

Pole light in stake pocket of the truck.

Just so you know. . . the tubing is thin wall steel half inch conduit with a slip coupling silver brazed to one piece. The spike is a piece of $^{5}/_{8}$ shafting ground into a long taper point. It too is silver brazed into the conduit. Initially I debated using a single piece of ten foot conduit but decided a two piece upright would be easier to stow in the truck. Suit yourself when and if you make up a loading light. The wiring is simple. However you should attach the clips to the wire so that the central terminal wire (black) goes to the red (positive) battery connector clamp and the white wire grounded to the fixture goes to the black ground clamp. If you think it is a good idea to use a cigarette lighter plug instead of the ground clamp, that is your choice, but remember cigarette lighters are fused for a light intermittent load and you will probably put a thirty-five candle power bulb in your loading light. So maybe the cigarette lighter plug is not a good idea. I do not think so at any rate.

To mount the light I took a piece of wood to fit into the truck bed stake pocket. I drilled a hole in it that would accept the pointed end of the shaft. The wire is clipped to the battery, and since the cord is long enough, the light may be mounted in either the stake pocket right behind the cab or stuck in the ground or on a stump.

Now I am lucky. I have never had to change attire with bees on at night. However once the pointed tip feature was helpful to a poor guy trying to change a tire a zillion miles from home three o'clock one overcast night. All I did was shove the spiked end in the ground and attach the cord to his battery.

OK? Have it if you like! It might be a useful gadget for you. Certainly it's cheap to make.□

Research Review

By DR. ROGER A. MORSE
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The Pesticide Season Again

Some agriculturists view honeybees as trespassers on others' land, and they feel no obligation to protect them from pesticides. Others believe it is the beekeeper's job to protect his bees from pesticides. I have seen many statements advising that bee colonies be covered with damp cloth, usually burlap, for one or two days after a pesticide application; this is said to keep the bees in their hives. Screening colonies is also advocated. Pollen traps placed on colony entrances have been suggested, for the purpose of eliminating contaminated pollen.

I reject these methods of colony protection for several reasons. The most important is that none of these approaches relieves the real problem. These methods are costly and beekeepers are not compensated for the work they must do to solve a problem they did not create. Second, honeybees are not domesticated animals. Bees can be managed because we understand their biology. Honeybees control their nest temperature and humidity within close limits, and we have never been able to modify or aid this system. Whenever humans confine bees, we interfere with a natural and delicate system. Covering, screening, and pollen traps are all dangerous. I have seen many colonies perish in minutes because they became overheated; this can happen even in cool weather.

For several years, the federal government compensated beekeepers whose bees died due to pesticide use. Unfortunately, this program was misused by a small number of beekeepers, leading to bad publicity. When the program was discontinued, many beekeepers did not seem upset; compensation had relieved the pesticide producers of any responsibility. While the compensation legislation was in effect, little research was done on avoiding honeybee losses. Entomologists in charge of pest control programs did not, for the most part, consider honeybee protection part of their program.

The Beekeepers' Position

Honeybees are an essential part of a sound agricultural economy. Without bees to aid in pollination, we would be deprived of many foods. Even on days when only one grower is applying a pesticide, honeybees in an apiary that might be affected are performing free pollination services for others; most pollination is free. Research conducted in recent years has shown that most honeybee losses can be avoided by applying the right materials under the proper circumstances.

It is not our job to determine which materials should be used; that is the field entomologist's work. Our job is to point out that most pesticides are used with no problems to beekeepers. When a loss does occur, an error has been made.

Reacting To A Loss

What should a beekeeper do when a loss occurs? Protecting the environment is officially the job of the Environmental Protection Agency at the federal level. At the state level, it is the job of the state departments of conservation and sometimes the department of agriculture. At the county level, an agricultural agent is responsible. Thus, three levels of government personnel must assume responsibilty for every loss. Each must be contacted when a loss occurs. If these people do not respond, one must get in touch with the elected officials who provide the money supporting agencies.

Keep a diary and a record of phone calls made. If government personnel fail to respond to a problem, their positions should not be supported with tax money.

Environmentalists are still active in this country, but the movement is not as strong as it was 10 years ago. Newspapers still run articles on pesticide misuse and pollution, and they should be contacted when pesticide-caused losses occur. Newspapers will not always respond quickly, especially if major world events are underway. However, newspapers are sometimes starved for news; when this is the case, reporters will often respond to a phone call and investigate the problem.

Pesticide Company Reaction

Some of the companies that manufacture pesticides appear to be much more on the defensive over the past few years. It is obvious that they wish to avoid adverse publicity. I believe that many people in the pesticide manufacturing business are realizing that they are responsible for the side effects their products may have. Certainly the judicial system and other organizations have recognized that the companies are responsible for carcinogenic materials.

Research

Few studies have been done on how to avoid the adverse effects of pesticides on honeybees. The U.S. Department of Agriculture and the states of California and Washington have ongoing projects with good financial support. Researchers in other states are interested, but little money is available to support their work. Beekeepers can help researchers obtain the money they need by working with legislators.□

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Pollen Digestability and Its Potential Nutritional Value

By JUSTIN O. SCHMIDT AND PATRICIA J. SCHMIDT
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It is easy to understand why pollen has natural appeal as a human food — it is the main source of nutrition for honeybees, the insects we probably admire the most; it consists of the vital reproductive cells of male flowers which are essential for the survival of the species; and it has played a role in the culture and writings of mankind since early in recorded history. With such attributes, is it any surprise that people out of romanticism, wishful thinking and/or lack of verified medical information eat pollen in hopes that it will benefit them or improve their diet? Part of the problem in discussing pollen and humans is that the scientific community and governmental agencies as well as the public do not know whether or-not to call pollen a food. As a result, no tables listing the nutritional composition of foods include pollen; food regulatory agencies do not set standards for quality nutritional studies on pollen. Another problem almost unique to pollen is that pollen is not a constant, predictable, known quantity. In the case of beef, beans, or beets, for example, we know that each is produced by one species of plant or animal and that one sample is pretty much the same as another. In the case of pollen, however, each sample consists of a blend of pollen grains derived from numerous, often several dozen, species of flowering plants. Hence, one sample is likely to be different from the next. Such non-uniformity of pollen composition creates real problems for scientific investigations and results in a general reluctance to study pollen. Thus, the problem compounds: little is known about pollen's potential in the human diet and little information is forthcoming.

The lack of even basic information on pollen and human or mammalian nutrition prompted us to initiate a nutritional investigation in which pollen was fed to young growing mice.

The Experiment

The experimental design is described in detail elsewhere [1] and will only be summarized here. In brief, nine male-female pairs of weanling 8 to 10 g mice were fed a diet in which velvet mesquite (*Prosopis velutina*) pollen was the sole source of protein. The diet was otherwise balanced. For comparison, 2 other groups of nine pairs of mice were fed diets in which the protein came from either whole egg or milk protein (Lactablbumin). Mesquite pollen was chosen because in warm desert areas large quantities are routinely collected in pollen traps and because the experiment could be easily repeated in future investigations using the same species of pollen.

The groups of mice were fed their respective diets for three weeks during which their diet consumption, fecal production, and weight gains were measured. An inert, nontoxic internal marker, chromium oxide (Cr_2O_3) was incorporated to allow calculation of the efficiency with which the mice digested the diets. The undigested protein in the feces as well as the protein in the diet were measured by the micro-Kjeldahl procedure.

The results of the experiment are shown in Table 1. The mice generally fed well on all three diets, eating slightly more of the mesquite pollen based diet that the others. This indicates that the pollen did not contain anything which repelled the mice, prevented them from eating, or was poorly balanced in terms of essential amino acids (intake decreases if the food amino acids are below minimal balance levels.) During the three week trials mice on all diets more than doubled in weight: on the mesquite diet they went, on average, from 9.1 to 19.9 g, on egg from 9.0 to 24.4 g, and on milk from 9.0 to 22.1 g. The feed efficiency value, a frequently used figure in animal nutrition studies, tells how many g of feed, or diet, must be consumed to produce weight gain on one g in the animal. As seen in Table 1, mice on the egg diet most efficiently converted food into body weight, followed by milk and pollen. Percent digestable protein is a measure of how much of the original protein in the diet is digested and abosorbed by the gut. This can be measured in either of two ways: 1) use on an inert marker (Cr_2O_3) which passes harmlessly through the gut and provides a measure of food removal during passage, and 2) actual measurement of all of the ingested food and all of the feces. Protein concentrations are measured in both cases. All three diets were well

Table 1. Growth and food utilization efficiencies of mice fed pollen, egg, and milk protein diets containing 10 percent protein.

Protein source	Av. daily diet consumption (g/mouse)	Percent wt. gain in 21 days	Feed efficiency [g diet cons. / g wt. gain]	Percent digestable protein Method 1 [1]	Method 2 [2]
Mesquite pollen	4.1 ± .3	119 ± 26	8.3 ± 2.2	80	84
Whole egg	3.9 ± .2	175 ± 17	5.4 ± .4	83	86
Milk (lactalbumin)	3.7 ± .2	145 ± 24	6.1 ± 1.0	90	91

1. Percent digestable protein = $100 - 100\left[\frac{\text{Conc. } Cr_2O_3 \text{ diet}}{\text{Conc. } Cr_2O_3 \text{ feces}} \times \frac{\text{Percent protein feces}}{\text{Percent protein diet}}\right]$

2. Percent digestable protein = $100 - 100\left[\frac{\text{Total g protein in feces}}{\text{Total g protein in diet}}\right]$

Continued on next page

digested. Although mesquite pollen has a hard indigestable outer exine wall of sporopllinin [2], the mouse digestive system released at least 80% of the protein form the pollen grains. This protein digestability suggests that other nutrients in pollen such as iron, zinc and the B vitamins may also be readily available, but critical tests to answer this have not been done. Also, other experiements with pollen from other plant species are needed to determine if pollen in general is as readily digestable as mesquite pollen.

This experiment demonstrates that mesquite pollen can be readily digested and supports good growth of mice. When compared to milk and egg protein-based diets, greater consumption of pollen is required to achieve similar weight gains. Nevertheless, mesquite pollen in combination with other protein sources should provide a blanced amino acid profile and be a reasonable use of the pollen.

Table 2. Average Nutritient Composition of Pollen.[1]

Protein	23.8 %
Lipids	5.9 %
Sugars	29.0 %
Phosphorus	4.5 mg/g
Minerals:	
Potassium	6.0 mg/g
Calcium	2.3 mg/g
Magnesium	1.5 mg/g
Sodium	.38 mg/g
Iron	180 µg/g
Zinc	95 µg/g
Manganese	75 µg/g
Copper	15 µg/g
Nickel	~5.4 µg/g
Iodine[2]	4-10 ng/g
Vitamins	
Thiamin	6.4 µg/g
Riboflavin	14.0 µg/g
Niacin	110 µg/g
B-6	7.0 µg/g
Pantothenic acid	20 µg/g
Folic acid	5.5 µg/g
Biotin	.44 µg/g
C	100+ µg/g
A	0
Carotines (as IU Vit. A)	33 IU/g
D	.33 ng/g
E	.01 mg/g
K	0
Energy	2.64 kcal/g

1. Values from Ref. (3)
2. Value from Ref. (2)

Nutrients in Pollen and Their Potential Nutritional Value

In this section we list literature esimates of the chemical nutrients in pollen and compare these levels with those officially recommended in the human diet. For a more detailed analysis of this subject, the reader is referred to a more extensive review published in the Proceedings of the North American Apiotherapy society [3] which is available from the Society (NAAS, 15621 Aitcheson Lane, Larel, MD 20707).

Table 2 is a listing of average levels of nutrients in pollen [3]. Many values in the table should be considered tentative or approximates. This is because some of the studies are rather old and modern methods may be more accurate. This is especially true for some trace minerals such as iron where widely divergent values have been reported. The caloric energy value for pollen was calculated by summing the energy content [4] of the protein, lipid, and sugar content of average pollen (.238 x 4 kcal/g + .059 x 9 kcal/g x 4 kcal/g = 2.643 kcal/g pollen).

Table 3. Recommended Dietary Allowances (RDA) and Nutrient Levels in the Average American Diet and in Pollen (per 1000 Kilocalories)

	Protein	Fat	Carbohydrate	Calcium Men	Calcium Women	Magnesium Men	Magnesium Women	Iron Men	Iron Women
RDA[1]	20.7g	-	-	296mg	400mg	130mg	150mg	3.7mg	9.0mg
Av. diet[2]	40.5g	45.7g	101.2g	347mg	384mg	129mg	143mg	6.6mg	6.9mg
% RDA in av. diet	196	-	-	117	96*	99	95*	178	77*
Pollen[3]	90.0g	22.3g	110g	869mg		567mg		34mg[4]	
% RDA in pollen	435	-	-	294	217	436	378	919	378
Pollen / Av. diet	2.22	.49	1.09	2.50	2.26	4.40	3.97	5.15	4.93

	Phosphorus	Vit. A (carotine)	Thiamin	Riboflavin	Niacin	Vit. B-6 Men	Vit. B-6 Women	Vit. B-12	Vit. C
RDA[1]	296mg	1852IU	.52mg	.59mg	6.7mg	.81mg	1.00mg	1.11mg	22mg
Av. diet[2]	604mg	2258IU	.64mg	.82mg	10.0mg	.74mg	.79mg	2.25mg	41mg
% RDA in av. diet	204	122	123	139	149	91*	79*	203	186
Pollen[3]	1701mg	~12000IU	2.42mg	5.29mg	41.6mg	2.65mg		unk.	38
% RDA in pollen	575	670	465	897	621	327	265	0(?)	173
Pollen / Av. diet	2.82	~5.5	3.78	6.45	4.16	3.58	3.35	0	.93

1. Based on values from reference (4) for 23-34 year old men; values for women based on 23-34 year old nonpregnant or lactating women.
2. Values from reference (5).
3. Obtained by multiplying values in Table 2 by 378 g/1000 kcal
4. Iron from vegetable sources (including pollen) only about one half as available as that for RDA; thus Table 2 values halved.

* Deficiencies are frequent in the American diet.

In general, pollen has high levels of protein, low levels of fat and sodium, and good levels of potassium, calcium, and magnesium. Pollen is an excellent source of the listed trace minerals as well as most of the B vitamins. Vitamin C levels are essentially average when compared to the Recommended Dietary Allowance (RDA). In spite of advertisements by some sellers, there is no scientific evidence that pollen contains any vitamin B-12 or remotely meaningful levels of the fat soluable vitamins D and K.

To put the figures in Table 2 into proper perspective they should be compared with the RDA levels [4] and with the levels present in the average American diet. Table 3 provides such a comparison. The nutrients listed in this table are those for which accurate dietary information is available [5]. The table is designed to allow quantitive and percentage comparisons of the average diet and pollen with the RDA value and, finally, to compare pollen directly with the average diet. In some cases the requirements and intake levels for men and women are different. Cases where those differences are important are separated in the table. If we focus attention on table rows 5 and 6 we see that pollen generally has nutrient levels several hundred percent greater than the RDA (except for vitamin B-12) and is also much higher than the average diet in many of the nutrients. This information in terms of dietary considerations is that found in rows 3 and 6. In row 3 nutrient defficiencies are noted with an asterik. Women frequently have deficient intakes of iron, magnesium, calcium and vitamin B-6. Men are deficient most frequently in vitamin B-6. It is these nutrients that should be of greatest immediate dietary concern — and for all four of them, pollen provides between 2 and 4 times the amount recommended in the diet. Thus, if pollen could become a part of the diet, it would be most helpful mainly in improving the levels of these four nutrients.

Not all the important nutrients in the human diet arelisted in Table 3. Those for which RDA values or nutrient intake levels in the average American diet are not known are listed in Table 4. Estimated Safe and Adequate Daily Dietary Intake Levels (EDI) [4] are listed for most of these. The EDI designation represents a less certain state of knowledge concerning dietary requirements and, hence, ranges of values are given. For many of the nutrients in Table 4, adequate studies on pollen are simply lacking and, therefore, no value can be listed. For others, such as vitamins D and K, the nutrient is essentially lacking in pollen. For most of the remainder of the list, pollen is a good to outstanding source. Sodium is an interesting element in that it is low in pollen, and, since the average diet contains too much sodium, the low levels in pollen are probably advantageous. Overall, the information in Table 4 indicates that for what little we know about these nutrients, pollen is probably a good source of at least many of them.

Discussion of Pollen's Nutritive Potential

On the basis of chemical analyses, pollen contains high concentrations of many nutrients. Notable nutrients deficient are vitamins D, K and probably B-12. Pollen simply has not been investigated

Continued on next page

enough to make statements about many trace nutrients. Chemical analysis can provide strong evidence that a potential food item is not particularly nutritious, but it cannot alone demonstrate nutritional superiority. This is because some of the nutrients may be unavailable due to poor digestability or absorbability or may be in poor balance with other nutrients. Complete nutritional studies involve feeding trials with animals to determine the availability of the nutrients. To date, well designed and reported feeding trials using pollen are scarce in the literature. Our study using mesquite pollen indicates that at least in this example, the protein is available.

Pollen, or for that matter, any food should not be considered in isolation from normal dietary foods. A good diet is one with a balance of different food types. Even excellent foods, such as liver, have some deficiencies (e.g. calcium) which must be supplied by other foods. Likewise, as pointed out earlier, pollen has some deficiencies. These facts should be borne in mind if pollen is to be an important part of one's diet.

Table 4. Other Essential Nutrients and Their Levels in Pollen.

	RDA or EDI/1000 kcal diet[1]	Quantity in 1000 kcal pollen[2]	Pollen level RDA or EDI level[3]
Folacin (RDA)	148 µg	2080 µg	14.1
Vit. D (RDA)	1.85 µg	.13 µg	.07
Vit. E (RDA)	3.70 mg	4 mg	1.1
Zinc (RDA)	5.6 mg	36 mg	6.43
Iodine (RDA)	55.6 µg	1.5-4 µg	.03
Biotin (EDI)	37 - 74 µg	166 µg	2.99
Pantothenate (EDI)	1.5-2.6 mg	7.56 µg	3.69
Vit. K (EDI)	26 - 54 µg	0	0
Copper (EDI)	.75-1.1 mg	5.67 mg	6.13
Manganese (EDI)	.93-1.85 mg	28.4 mg	20.4
Chromium (EDI)	.18-.74 mg	?	?
Molybdenum (EDI)	.055-.185 mg	?	?
Floride (EDI)	.56-1.48 mg	?	?
Selenium (EDI)	.18-.74 mg	?	?
Sodium (EDI)	407-1220 mg	144 mg	.18
Potassium (EDI)	695-2080 mg	2268 mg	1.63
Chloride (EDI)	630-1890 mg	?	?

1. See footnote 1, Table 3.
2. Obtained by multiplying values in Table 2 by 378 g/1000 kcal.
3. The average of the EDI range is used in calculation.

There are several potential problems involved with pollen as a human food source. These include possibilities of pollen contamination with heavy metals, persistent pesticides, or naturally toxic pollen species, or being a source of digestive food allergy. Space here does not permit discussion of these subjects, but for general discussions see reference [3].

Pollen can be considered either a potential food or a nutrient supplement. Whatever it is considered, potential consumers should be aware that the levels present in half a dozen tablets, or about 3 g, does not provide nutrients to equal those present in an otherwise balanced diet. For example, even the iron, zinc, riboflavin, and manganese levels (the nutrients in greatest concentration is pollen) in 3 g of pollen are only 3, 5, 7.5, and 15% respectively, of the suggested dietary intakes. This is not to suggest that pollen cannot be of any value, only that if pollen is treated as food, more than 6 tablets may be needed to accrue real benefit. When compared to supplements such as vitamin/mineral tablets, pollen contains much lower levels of these micronutrients than the supplements. Thus, if one feels supplements are advised in the diet, pollen tablets should not be used in place of usual supplements. This discussion does not imply that pollen has no potential benefit, only that it should not replace good dietary and health practices. Pollen in addition to a good diet could conceivably be beneficial, but to date there is little evidence to support or refute this. There are claims that pollen has miraculous properties, or that it contains materials that are unknown or poorly understood by science, that can make pollen ingestion beneficial. Such claims or implications cannot be addressed in a paper such as this because science can only effectively deal with facts and known quantities, and not with unsupported speculations and unknown "factors".

In conclusion, pollen is an intriguing material which appears to be digestable by mammals and which contains a plethora of dietary nutrients. It does, however, lack several nutrients and is usually consumed in small quantities. Potential benefits from consuming pollen, at least in the usually consumed quantities, are unknown, but it is not inconceivable that a person who has a poor nutrient balance could benefit by the small additional nutrient quantities in pollen. In this way pollen could be of aid to people whose diets are slightly deficient in one or more nutrients by bringing their nutrient dietary levels up to at least near adequate levels.□

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Beekeeping Folk Arts

By AMOS ARBEE

This little story has, no doubt, touched each of our lives somehow and somewhere through our voyage through life. It involves a family who had been vacationing last summer several states from their homestead. They came across a food product on their travels that, for them, was truly out of this world. Still very elated about it after their trip home, they wrote to the shop where they had first purchased the cherished item. In due time they received a reply acknowledging all the great things they had found in this product; but in all fairness to them, the shop pointed out that the item had been manufactured and shipped to them from a company only 20 miles or so from where the people resided throughout the year. Accordingly, this cliche may well be true: "You may be just sitting atop an oil well, unknowingly, in your back yard!" So it is with those of you who are beekeepers and do not yet use your very own honey as often as you could in cooking and baking. What better place to start than with a summer recipe?

CITRUS/HONEY SALAD DRESSING

Put bowl and beater in refrigerator to chill thoroughly. Mix together:

3 tbspns. of orange honey
3 tspns.orange juice

Using chilled bowl and beater, whip ½ cup chilled whipping cream. Beat honey mixture into whipped cream w/final few strokes. Goes great with chilled orange slices or grapefruit sections!

1984 EAS CONFERENCE

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MONDAY, August 6:
-- EAS Short Course, Dr. Larry Connor
TUESDAY, August 7:
-- EAS Short Course Continues
-- Honey Bee Disease & Pest Seminar
WEDNESDAY, August 8:
-- Short Course Continues
-- Queen Rearing Seminar
-- Master Beekeeper's Certificate Exam
-- Registration for Gadget, Wax, Cooking & Photo Show
-- Bay Cruise and Buffet Dinner

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PRE-ENROLLMENT IN THE SHORT COURSE AND/OR THE SPECIAL SEMINARS IS REQUIRED. REGISTRATION FORMS AND ADDITIONAL INFORMATION DETAILING SPECIFIC EVENTS WILL BE MAILED TO EAS MEMBERS BY THE END OF MAY. YOU MAY ALSO REQUEST FORMS BY WRITING THE EAS-84 COMMITTEE, 107 CHATWORTH RD., NORTH KINGSTOWN, R.I. 02852

THURSDAY, August 9:
-- Hobby Beekeepers, Dr. James E. Tew
-- Parastic Mites, Dr. H. Shimanuki
-- Drugs Used In Prevention of Bee Diseases, Dr. H. Meyers
-- National Extension Ag. Program, Dr. B. Frugala
-- African Bee Update, Dr. B. Frugala
-- Worldwide View of Apiotherapy, Dr. J. Belleveau
-- Workshops: Observation Hive and Solar Extractor Building/Mechanics of Honey Judging/Nosema/Removing Bees From Honey Supers/Hands-On Bee Diseases/Workshops: Beeswax/Rams Den Batik/Ukranian Easter Eggs/Dipped Candles/Poured Candles/Rolled Candles
-- Bee Beard Contest
FRIDAY, August 10:
-- Artificial Insemination, Dr. J. Harbo
-- Bee Swarms, Dr. D. Caron
-- Creative Ideas in Packaging and Marketing Honey, Ann Harmon
-- Honey, Hive to Table, Bob Cole
-- Save The Bees, Steve Forrest
-- Roadside Marketing, Richard Taylor
-- Repeat of Thursday's Workshops
SATURDAY, August 11:
-- Diverting Bees From Pesticide Contaminated Fields, Dr. Roger Hoopingarner
-- Pesticide Update, Dr. Larry Connor

California Queen Auction Nets $$

By LARRY GOLTZ, Western Editor 1230 Canby Rd. #122 Redding, CA 96003

Eighteen well known California bee breeders recently brought a total of 32 queens to the annual queen auction at Chico, California. Approximately $7,355 was realized from the sale of the queens, an average of about $230 per queen.

Queen breeders bring the queens, both tested and untested, to the auction the morning of the sale. By tested it is meant that a queen has produced brood and acceptable daughters. The queens are brought to the sale in one frame observation hives which confine the queens to single combs along with their entourage of worker bees and an ample supply of honey. Most combs have brood in several stages from the queen being offered for sale. As each queen is brought in she is inspected for condition (no missing legs, etc.). A lot number is assigned and the breeder's name recorded. The consigned queens are displayed on tables for inspection before the sale begins.

This year's queen auction was held at the Silver Dollar Fairground in Chico, California. The rules of the auction are relatively simple. Fifteen percent of the proceeds of the sale of each queen goes to the California Bee Breeders Association to defray the costs of the sale. A part, or all of the proceeds from the sales of a queen may be donated to the queen fund, should the seller so desire. Persons entering the queen may bid for that queen only once. Most queens entered in the auction are two-year old queens, but some are one-year-olds which were tested in the fall. Most queens consigned are of the Italian race, although there were also several entries of the Caucasian and Carniolan race.

Prior to the beginning of the bidding, the breeder's name is read. Typically, a description would read thus: "Lot number eight, John Allred from Madera, California. This is an untested Italian breeder. History: Late 1983 queen, mated to selected drones by natural mating in an isolated area of the Sierra Nevada Mountains. The stock is the best of a combination we have selected over the years. The queen was mated and held in a five frame nuc. This stock is gentle, prolific and productive. This foggy winter, on January 28th, she had brood in three combs without any supplemental feeding—John Allred, Madera, California." Descriptions were read by Art Thomas and Shannon Wooten.

And, so the bidding began. Most of the bidding began at $100, advancing by increments of from ten dollars to twenty-five dollars, though bidding up may be by lesser amounts as a top figure is approached. A group of clerks keep close tabs on the lot numbers, the sellers and buyers, and the selling prices of the queens. Homer and Jack Parks acted as spotters for the auctioneer, but were also free to participate in the bidding.

PHOTO 1. Ray Oliverez or Orland, California purchased the queen bring the top price and also one which brought the third highest price bid at the auction.

At the end of the bidding a tap of the gavel on the table signifies the close of bidding on a queen. The auctioneer calls out the buyer's number which had been assigned to the queen breeder or participant when the queen was brought in for sale.

This year's bidding for the top queen was spirited and brought a top price of $700. Six hundred and thirty dollars was paid for another queen and $475 for another. The average selling price was $230 per queen. Fifteen percent of the proceeds of the auction went to the Breeders Associaton; however, several breeders contributed all or part of the proceeds to the California Honey Queen Program. 1983 California Honey Queen Annette Jreitas finished fourth in the honey queen competition at the American Beekeeping Federation meeting in Minneapolis in January.

The two queens bringing top dollar at this years queen auction were consigned by Strachan Apiaries of Yuba City, California. They were Carniolans. The queen bringing $630 was an untested queen of stock originating from Hastings queen breeders of Birch Hills, Saskatchewan, Canada. She was sold to Penner Apiaries of Red Bluff, California. Lot #29, was sold for $700 to Ray Oliverez of Orland, California. A queen bringing $475, consigned by Steve Park of Palo Cedro, California was also purchased by Mr. Oliverez.

What is the purpose of the auction? Primarily, the auction serves to disperse breeding stock, somewhat like dispersal sales held by cattle breeders. Genetic variability tends to increase vigor among bees much as in other animals, hence the advantage of introducing new stock to a queen breeder's program. The new stock should come from outside the breeder's area and the breeder queen should have good lineage with the potential of transmitting superior characteristics to her offspring. The ability to produce daughter-workers with good traits is also dependent on her having mated with outstanding drones, a precaution observed by queen breeders. This is done either through artificial insemination or by having queens mated in isolated yards where the superior drones are concentrated. The very best breeder queens offered at the queen auction and by other queen breeders represent top lines of breeding stock dating back many generations of breeders. These better breeding lines are often treasured by a human family of queen breeders, forming the basis of many quality offspring sold to other beekeepers.

Continued on next page

PHOTO 2. John Tollett and Cliff Thomas examine a queen being entered in the auction.

Altogether, the California queen auction was an interesting experience, with much good will and banter among the participants, but with the serious business of buying and selling breeder queens.

Joe Wright of the Wright Apiaries, breeders of Mother Lode queens in Mokelumne Hill, California is the president of the California Bee Breeders Association. Carol Penner, Red Bluff, California is the Secretary.

President Wright said that they would like to have bee breeders from other areas participate in the California Bee Auction. Indications are that this event will expand, and given the success of this and past auctions it may be something that more bee breeders may wish to participate in in the future.□

QUESTIONS & ANSWERS

Q. Can comb honey that does not get finished and capped over by the time the season ends be kept over in a deep freezer and returned to the bees the following summer to finish? Raymond Hayes, St. Johnsville, NY.

A. Yes, this can be done, and I have returned entire unfinished supers to the hives the next year with fairly good results. There are, however, two problems that can arise. First, unfinished comb honey still on the hives at the end of the season is apt to be very waxy, since the foundation is likely to have been drawn during cool weather. The sections finished the following year will, accordingly, be very waxy too. And second, unfinished sections left on the hive a week or so with no nectar coming in are likely to be propolized around the edges, making them unsightly, and this propolis cannot be removed. **Richard Taylor.**

Q. I have a question about the shook swarm procedure for comb honey. My hives are in a row up against the barn. There is no room in back of them or beside them to put the parent hive after they are shook. What else can I do? James Davidson, 20551 St. Rt. 58, Wellington, OH 44090.

A. You can put the parent colony on top of the new shook swarm colony, facing backwards, this makes a bit of a problem when you come to harvest the supers, but it can be managed, if you have a strong back. **Richard Taylor**

Q. I have lots of swarms. I try to make the best of them by uniting them, via newspaper method, to whatever colonies seem to need strengthening. This is not the greatest idea I ever had, but I could not bear to just let the swarms go.

This winter I lost two colonies. I would like to padgen the first two swarms that come out (that is, move the swarmed colony off to one side and hive the swarm on the original stand of the swarmed colony, using the combs from my two winter killed colonies), then later, when I get more swarms, use those to bring the swarmed colonies back to strength. How would that work? David W. Grant, 48 Church St., Enosburg, VT 05450.

A. Padgening almost always works well, but I think it is better to try to control swarming than to resign oneself to it and then use the swarms to strengthen the colonies. I have not found that colonies seemed much strengthened just by being combined with swarms.

All effective swarm control measures involve splitting the colony in one way or another. This does not necessarily mean increasing the number of colonies, for there are various ways to reunite divided colonies.

Perhaps the simplest swarm control method is to split out three combs of brood and bees from the center of any colony likely to swarm, replacing them with drawn combs or foundation, then create a new colony with these combs of brood and bees, using nine per hive body. Six colonies can be treated that way getting only one new colony; or you could deal with twelve that way, thereby replacing the two you lost over the winter, assuming you use two-story hives. Combs of brood and young bees will mingle without fighting. Requeen the new colony thus created with brood combs split out from your other hives, or be sure there are queen cells with it. That should more or less solve your problem, with little or no increase in number of colonies. **Richard Taylor**

Q. In your April issue, p. 213, Dr. Taylor said there is no point in using the shook swarm method for producing extracted honey. Why not? To get the maximum honey crop you want the maximum number of bees and keep them from swarming. Here in Western Oregon it stays wet until mid June, the bees warm, and we lose our crop. It seems to me that shook swarming would be the way to go. Samuel Martin, 80 Azalea Drive, Eugene, OR 97404.

A. The comb honey beekeper has two problems that the producer of extracted does not have. He must get the bees to enter the supers quickly, and get the sections filled and capped over quickly, before they get travel stained. It is no problem getting bees to work in extracting supers, especially if they contain drawn combs, perhaps even sticky ones, and travel stain is no problem either. In addition, shook swarming requires more time consuming manipulation than most producers of extracted honey want to do, especially if they have several hundred colonies.

Still, it might be a good solution to your problem of excessive swarming. If you use it, shake **all** the bees into the new hive, preferably a shallow super, leave a comb of brood in that new hive if you can, use drawn combs rather than foundation if you have them, place the left over brood combs over a **strong** colony in the apiary with an excluder underneath to prevent the queen from going up there, and then, a week or two later, return that hive body full of brood **and bees** to the shook swarm colony. This method was developed by Harrison Ashforth, in England, and it results in the strongest possible colonies with minimum tendency to swarm. **Richard Taylor**

Ed Betleski, West Salem, Ohio, with a basket of bees during swarming season, circa 1943.

Success Was Our Only Problem

By LOIS E. STAUB New Oxford, Penna.

Our leap back into the bee business after nearly 30 years of urban living was one of the most drastic, albeit successful undertakings of our marriage which, by any standard, has truly been an adventure. And me thinks package bees should carry a disclaimer to read, "These creatures may have a devastating effect on the peace and tranquility of retired persons".

My husband, Robert, whom I call "Bob", had hived his first swarm when he lived at Hampton, Pennsylvania as a young boy. He took his bees with him to upstate New York where he moved in 1930, and had built up to 55 hives by the time we were married in June of 1940.

A couple of years later, our bees began to take a back seat as we plunged headlong into the poultry business. We raised chickens, first in New York state and then for nine years at Biglerville, Pennsylvania, during which time our only son was born at Gettysburg in 1946. While in the poultry business Bob became very proficient as a carpenter and put that talent to use the entire time we were in Arizona later on.

In 1954 we quit farming and took a vacation. While visiting my sister in a village just east of Syracuse, New York, we had parked our car along the street in front of her house, and one evening a drunk driver slammed into the car, keeping us there another week. During that time, Bob and I both found employment in that area and very soon had bought a ranch type house where we planned to live "forever." However, after three years, the lure of sun and sand in the southwest overtook us and we headed for Phoenix, Arizona where we lived for 21 years.

In 1979, our son and his family left Phoenix to move to Arkansas. That fall Bob, who had retired two years earlier, drove back to Pennsylvania for a visit with his family, which led to our moving back east in June of 1980. We are just one mile from the home where Bob lived as a boy. Full circle!

When we first moved to our one-acre "farm", we had so much remodeling and repairing to do, it took up all our time. Then in the fall of 1981 Bob said, "I'd like to have three or four hives of bees." I replied, "Then you should have them!" He knew of a swarm in a tree and another in a house, both of which he had obtained permission to remove in the spring.

About that time, we sent for two package bees which were to arrive the first week of May. The next thing I knew (I must have lost my mind) I had printed signs to put up in stores, laundromats and the like, indicating that beekeeper Bob would remove any swarms which might be bothering anyone. We also ran an ad in the weekly "little paper" which comes out every Tuesday. Wednesday morning the calls began. The first caller, before having seen the ad and not knowing what else to do, had tried to destroy them. Thus, apparently, the queen and a goodly portion of the flying bees were gone, so that Bob came home with a weak and queenless bunch.

Just prior to this and already 10 days late, our order for two package bees arrived in horrible condition. All but one queen and her attendants were dead. Consequently, we had to re-order, making us very late getting started. Bob introduced the surviving queen (which your writer had lovingly kept alive) into the weak and queenless swarm and we ended up with a good strong colony for wintering.

Bob Staub in his apiary.

It began to appear to me we were exceeding the original proposed quota rather substantially and, occasionally, I would say to Bob, "You don't have to go and get every swarm someone calls in, do you? What's wrong with saying 'No'?" The calls came so fast (and we were extremely busy with garden, chickens, rabbits, flowers and lawn) that he finally did say, "We can't handle any more."

Over the summer Bob used his newfound knowledge to cone out seven swarms from houses, while shaking bees from trees into burlap bags to bring home. As fall approached, we had 17 colonies; but, in an effort to keep the total number to a minimum, Bob employed the double screen method to consolidate two hives into one in many instances.

Now back to the original two free swarms. The first was in the ceiling of the kitchen of a then empty stone house only a quarter of a mile from our home. Bob built a platform for the hive oustide the entrance, then removed the sheet rock and lath from the ceiling. With a flashlight that was soon completely smeared with honey and following dozens of stings on his hands plus being up to his elbows in honey himself, he managed to get the bees, comb and brood out of the ceiling, tied into nine frames, and into a hive body.

I cannot emphasize enough the strength of that swarm and what it meant in relation to our going into winter with 12 strong colonies that first fall. For Bob robbed them of a frame of brood five times following calls to "**please** come and get these bees **out** of my house!"

The one in the tree swarmed again before Bob could get to it there, but he got it, in a rain storm, out of a disc harrow where it lit the second time.

Bob had told me repeatedly that there would be no chance of our producing honey that first summer due to our getting such a late start. His reasoning was based on his experience of producing honey years ago. However, having read Richard Taylor's "*The New Comb Honey Book*" and getting all steamed up over the discovery of **round** section comb honey, he said, "We're going to try it!"

We sent in an order for all the supplies needed for three supers and the two of us worked feverishly assembling supplies we had never heard of, much less seen, and had the supers, together with queen excluder over the top of shallow frames in a $6^{5}/_{8}$" super, a la Taylor, awaiting a strong swarm. Three days later, we got the call!

Fifteen miles away a lady had a "huge swarm." We both headed for Jefferson to find it wasn't nearly as large as we had hoped for; but Bob hived it with the three supers on top ready to go. When we

Continued on next page

brought it home, the weather was cold and rainy for a while, then it cleared and warmed up and, about six weeks later, Bob took off one super of the most gorgeous light-colored honey imaginable. I took out 32 rounds, then replaced the plastic sections, and Bob put the super back on the same day. The bees then filled all three supers, giving us a total of 128 rounds, not all of which were perfectly filled out; but nearly so, and we surely enjoyed eating the imperfect ones while blessing the one who had the ingenuity to furnish us with such a remarkable way of enabling the bees to package our honey for us. Thus, in spite of Bob's dire predictions to the contrary, we did indeed reap some goodies for our efforts our first year!

The author with funnel and box used to capture swarms.

We do not live in a tourist area nor are we on a main road. But putting a sign in our yard brought a few customers and the word was out. A friend sold a few at her yard sale then, except for two we decided to keep as an experiment with the shelf life of our product, we had an even dozen left. Another friend said, "Let me have them to show my golfing friends." She came back with the money and no honey and said they wanted MORE!"

At one point, we had to wait for the UPS man to bring supplies to put supers together to keep up with our rapidly expanding business. One of the swarms Bob coned out of a house produced two supers of beautiful (square) comb honey at a time when we were so busy with new swarms, we had all but forgotten about it. The lady who had first kept calling to say the bees were hanging outside the hive. And Bob kept adding supers to keep the bees . . . and the lady . . . happy!

As I write this, we've weathered a second year of honey production. It was a year filled with surprises, among which was a two-week visit from our son and his family whom we hadn't seen for three years. We, of course, thoroughly enjoyed visiting with our family. However, nothing at all was accomplished with regard to getting honey off or getting it packaged and labeled. Another year, when they come, we are prepared for them to help us. . . something they wanted to do last summer; but we simply were not set up for it.

Our 11-year-old grandson insisted on donning Grandpa's veil and getting out into the bee yard with Bob. Then he borrowed a blank tape and, after getting Grandpa comfortably settled on the front porch (a miraculous act in itself), Michael asked questions which Bob fielded for him. He then proudly took his question-and-answer tape back to Arkansas along with a complete beginner's outfit. His family is totally supportive and will help him get bees this spring so that Michael can begin to satisfy his fascination with bees.

Our first year we planned to have only comb honey, with the possibility of gearing up to produce extracted honey another year. We put our comb honey supers out and turned our attention to preparing a honey house with adjoining equipment storage room. Meanwhile, and providentially, since we would be buying one eventually, we bought an extractor in midsummer. We were like kids with a new toy the day it arrived. And the wisdom of that move was apparent when the honey flow stopped very suddenly in the extreme drought, leaving us with a considerable amount of partially filled combs.

It was then that my innovative husband came up with the idea of making folding wire baskets which would hold eight rounds of comb honey. He used a fork to pick off the cappings and, when the basket were closed, they fit perfectly into the baskets of the extractor so that we managed to extract all of our unfilled combs. (It is not a recommended procedure; but in a situation over which we had no control, it wasn't too shabby since it served to recover a goodly amount of honey which we were able to sell.)

When one puts an ad in the paper which reads, "If you get a bee in your tree, call Bob", there is no telling where it will take you! We have taken bees off the trunks of trees, off road graders; we've scooped them out of the grass, and have answered calls to save them when a tree has fallen with one in it. . . and almost always with a captive audience, with cameras in hand! Once Bob went alone to recover a swarm which had landed in the middle of a paved road. He used the branch method which I allude to in the next paragraph.

Bob's niece called to say there was a swarm on the side of her house and if he didn't come and get it, she was leaving town. That's when, while his admirer sat on the curb across the street, he thought up the idea of cutting a switch-like branch and coaxing, by gently brushing, the bees onto the branch before shaking them into the swarm cage to bring home.

Our four swarm cages are another of Bob's inventions and provide us with the means of keeping the bees in the basement until a convenient time to house them, either as one unit or by combining one or more. I hold the cage with a large funnel in place, Bob gives the branch a tremendous shake, then he pulls the funnel, I slam the door shut and we can leave the scene in a little over five minutes.

The Staub beeyard in winter

I should pause here to explain that while it was entirely Bob's idea to have a few bees, there came a time when the whole project simply blended into a joint effort. There are probably two main reasons for that fact: 1. As I would accompany Bob, I became strangely but thoroughly fascinated by the little darlings, myself, and 2. I recognize success when I see it. One more thing. . . we have been slowly but surely successful in capturing good markets for our honey so that all things considered, it is safe to say the bees, the work, the pain, the pleasure, and the profits belong to both of us. Of course, to a degree, at least, I still ride the brake while Bob keeps his foot on the gas.

We "enlarged our borders and strengthened our stakes" last year, too, when we joined the Adams County Beekeepers Association where your writer was elected secretary and Bob serves as treasurer. Our amiable president, Herb Schroeder, rescues us when we have any metal work to be done, such as the funnel we use with our swarm cages. And our exchanges of ideas with that fine group make our hobby/business ten times more

Continued on next page

delightful. We may never make a lot of money with bees, but the pleasure we derive from watching them and from shipping our little rounds of comb honey to friends nation-wide, cannot be bought with money.

You must remember that Bob had said he wanted three or four hives of bees. Yet I noticed when he built the first platform to set them on, he built it to accommodate 12 hives! We now have platforms for 40 colonies, too many for here, but we've located outyards with such kindly folk as Josh and Hattie. That couple has been married for 57 years and they spend their afternoons on a paper route! Do I need tell you what an inspiration they are to us?

We've had no problem getting bees, and Bob has done a tremendous job of producing comb honey. In fact, our yields, in spite of the extreme drought last season, and overcrowding our space, have been phenomenal. That kind of success has had Bob building and painting supers in our basement all winter again this year after I had recorded in my diary last year his saying, "If I haven't built enough yet, then heaven help us!" I've just checked and he says he has made 75 more since that time.

We were planning to put our ad in the paper a bit earlier this spring, and no doubt we will. However, on January 5th, the county highway truck stopped and one of the men approached Bob to ask if he'd like a bee in a tree they were cutting down. Thus, we have a 6-foot length of tree two feet across, with bees in it, in the corner of our beeyard. . . our first catch of the season!

The addition of the tree makes 35 strong colonies coming through winter in good shape. I am completing this story so that I can put my typewriter away and begin getting comb honey supers ready, for before too long the day we're waiting for will be here. . . when we can go through each hive and make the necessary notes prior to requeening and all the other good spring chores.

We have discovered we cannot accomplish as much as we once could. And we have put aside many other projects in order to focus our attention on one of the most amazing creatures in God's universe, namely, the honeybee. And, from where I sit, the success we've enjoyed since Bob's first mention of a desire to have a few bees, is reason enough to continue on the path we're on.

In summary, I must borrow a line from Richard Taylor and say, "There are times in our beeyard and in our honey house when we know we must be the happiest people on earth!"□

Burdock As A Nectar Source

By FRANCIS O. HOLMES Rt. 2, Flanders Rd. Henniker, NH 03242

How many beekeepers would be excentric enough, or perhaps enterprising enough, to consciously cultivate the common burdock, *Arctium lapp L.,* as a nectar source for honeybees. Nevertheless it may be of interest to some beekeepers to know how much honeybees like this common weed of rad edges and other more or less waste areas.

For some years I tried without much success to kill out this rather ornamental, but prickery, flowering plant. It still persists in spots of sandy soil on our own farm, as it does also around local parking places in town and on the margins of our town dump.

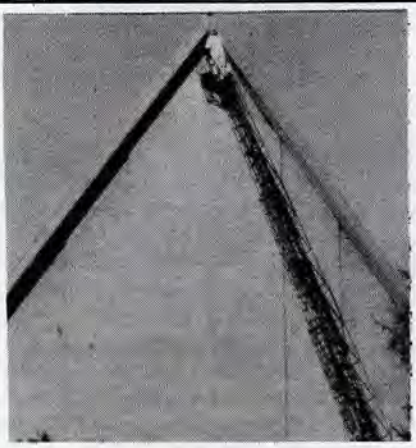
Honeybees visit the flowers of burdock from early morning to evening and it is not uncommon to observe a bee selecting the freshest flowers and feeding ten to twenty-five seconds on each of them. Not many nectar plants hold the attention of honeybees as long as this. Aney period exceeding fifteen seconds between flights means a highly satisfactory supply of nectar.

The persistence with which burdock plants endure the severe competition along roadsides and waste places owes much to the large number of seeds produced by each flower and also to the tendency of the ripe seed-burs to cling onto fabric or fur and so to be transported considerable distances before falling to the ground to initiate new colonies of this weed.

If the sturdy burdock plant were weak and difficult to propagate, it would probably be cultivated as an ornamental plant; but gardeners are generally afraid that it will drive them out of their own flower gardens.

Arctium lappa L.

The period of bloom of burdock is around mid-August. This is a time when other nectar sources are difficult to find in many localities. Hence honeybees search out small groups of burdock plants, or even single individuals, and many beekeepers do not recognize where their field bees find the gray pollen and abundant nectar that come from this obscure nectar plant.□



Bees went into space with the Space Shuttle a few months back. Kenneth Pound, Columbus, Ohio beekeeper, went that general direction himself to retrieve this outside nest of bees from atop a church. There are those who say beekeeping is a "natural high."

The Way It Is

By THE OLDTIMER

Now I know full well that not everyone is so inclined — but prompted by, and to respond to a lady acquaintance of my wife's, here-with a few pages from the diary of some of us who live 'differently' (to put it mildly) — 'out of step' perhaps with the rest of the road'.

The total population of 'Hidden Valley' — both of them — and me, stood a few paces out from the cabin door in our bare feet; heads cocked towards a black rift in the mountain chain down range from whence came the steady drone of an engine in labour. Standing thus in dewy coolness — perhaps an hour before dawn — we must have presented a bizarre spectacle. However, I was oblivious to this comical display — being completely absorbed with my mind's eye and its picture of a cluttered cab containing its solitary occupant (my son) straining forward; tired eyes expertly appraisng the road ahead lit by dancing headlights. Behind him, I could also visualize the vehicle's flat-deck and twenty (ten mine) overwintered two-story hives of honeybees jammed securely between plank side racks — along with an antique cast iron range, dismantled second-hand horse drawn mower (for hay) — bundles of knocked down supers, frames, jars, tins and other impedimenta. Knowing my son's ability to cope with almost anything countrified, helped immensely in stilling most of the queasiness my stomach just now experienced at the recollection of that that torturous stretch of road leading up into the this valley. My two cronies here call it simply 'mile hill' — a name which doesn't say much for its, heart-in-mouth properties because, while it is for a fact that we've all been on mountain trails which were 'somewhat' uncertain; and negotiated tongue-in-cheek-wise — this has got to be up there with the best (or worst) of them. It is any wonder then, that with ears tuned I willed myself to ride ghost-like on that hair-raising gradient; You see — he's (my son) never been here before — he's traveling according to a map we drew at my place — and log markers which were put out several years ago and updated recently. He knows full well though from our instructions and no doubt his instinct, that once embarked on 'mile hill' there's no turning back. He must continue slowly — steadily to the summit and valley entrance for the steepness coupled with narrowness along most of its way would make backing up — suicide; Even stopping and starting again would be hazardous and in most of the distance impossible due to the scree from above being constantly deposited on its surface. Halfway along its length for instance, you have climbed to several hundred feet above a rocky canyon floor, on a ledge which at this point is only a little more than a foot wider than the truck. Furthermore, two corners require perfect judgement **first** time — you'll not get a second chance. A mountain is a fearsome thing but not withstanding beautiful in my eyes.

I myself have driven or been driven **up** this road only twice — first when I brought Fred Foster (standing beside me here) in two years ago with most of his furniture and effects and again about a week ago when he brought me in. I've drive **down** just once and that was on the momentous first occasion here — I'll not easily forget that period with its culminating incident. It was one of those autumns which looked like it could go on forever — crisp golden days — a hint of woodsmoke everywhere — multi-colored leaves dripping all around — hazy morning clamorous with ruffed grouse — ducks and geese appearing and leaving daily (an omen which I should have heeded) — deep, deep blue skies, even I remember, a few small flights of gnats dancing here and there in warm puddles of iar. Anyway, after we had done messing around getting Fred settled in his newly built cabin, I must accompany him and Mike to a small lake in an adjoing valley which is simple teemed with trout (and cranberries, by the way) and surrounded by forty feet of shingly beach between water and forest comprised of the whitest, roundest stones I believe I've ever seen in one deposit. A third pleasurable day exploring and fishing in a veritable Eden — known only to we three lucky ones — came and went, but that evening there were no stars and it got somewhat colder. Round the campfire over a superb fish supper we thought it best to head back after breakfast; We did — in a heavy snowfall, and later that day at the cabin Mike said, "It looks like, John — as if you've got several choices — One, you can stay here the winter — plenty of grub. Two, you can walk out, or three — we load your truck down with logs for better traction and take a chance driving down Mile Hill. There's a kind of ditch along your off side most of the way down which should keep you from veering across the road so. . . .

So about mid-morning, heavy laden, we struck out (all three of us in the cab) there was a foot of snow by this time and still coming down. It would snow for a while then stop abruptly and start up again just as suddenly. When we nosed carefully over the rim and started down I don't think any of us breathed; Then with a wrench my right-hand wheels slipped into the gully, broke through the ice and we were on our way — next stop bottom or?. . . . . .

Gingerly — at a snails pace — would be my choice of words to describe our progress down that awesome grade. With the windows open, snow blew in, swirling and filling the cab but everyone was so preoccupied with trying to peer through the hazy white curtain a few feet in front of the vehicles nose with one eye and the black mountain wall sliding by on our right with the other to pay any heed.

Down — down, and in what seemed like an eternity Mike whispered, 'the switchback is about a hundred yards further on, I can tell by that overhang we just passed. You'll have to be extra careful there, for there's no ditch and the road slopes **your** way'. I was in the middle of saying 'That's all we need for added excitement when Lo and Behold, visability suddenly increased as white flakes became mixed with driving rain. In another twenty yards we ran out of water-saturated snow and onto wet, bare roadway. Now this phenomenon is characteristic of the high-country quite markedly. Even in the summer I always carry parkas — down-filled sleeping bag, etc., to accomodate for these sudden changes which can dip to well below freezing at the drop-of-the-hat. Hang on — just to show you what I mean — an incident just came to mind concerning last summers high-country apiary and since those notes are handy I'll just copy word for word.

—Thursday 1st July (mountain, north of Hope) weather — HOT. Fri. 2nd. — HOT. Sat. 3rd — HOT. Sun. 4th — SHOWERS, CLOUDY, BREEZY. Mon. 5th — HEAVY, WET SNOWFALL LAST NIGHT. COLD NOT FREEZING. All the Alder bushes and fireweed flattened by weight of wet snow. The landscape has changed dramatically — my hives are still here — but in a alien world. Tues. 6th — Chiook conditions prevail. Bees working like mad. Flora returning to normal.

Fred and I both began rolling up windows against the deluge and Mike saying, 'Don't stop here, there's a wider stretch down aways where you can pull over so

Continued on next page

we can open the door.

In a few minutes we did just that and then I watched with concern as my two friends — parkas draped over heads — begin trudging stoically into the heavy grey downpour, homeward bound. At the last minute they both turned — big grins on their grizzled faces — and waved me on my way. (Have you got neighbors of this calibre?) My headlights catch the tops of storm tossed trees across the ravine and as I let in the clutch I think 'This is the life'. ——NO, you say. Well, I said I wasn't **normal. I think mountains** and therein lies the difference. Tell you what, try a week or a month in the high-country sometime — I must warn you though — a part of you will **never** leave. The existence of all living things, I'm convinced, depends on nature and more specifically — the wilderness. Once its gone — its all over with life on this planet. On a much cheerier note and to further elaborate my 'oddness' ——A few days ago — returning from a long hike which I had begun after a hearty breakfast at the crack of dawn — about mid-afternoon I found myself near a majestic lone pine, where beneath and all around its great bulk there was a large area of golden-yellow needles (leaves) several inches thick. Whereupon with hardly a momehts deliberation I flung myself, and digging my hip into its springy firmness with a pent-up sigh of pleasure in a trice was fast asleep (no need of drugs or even counting of sheep out here). I don't know how long I slept as I never carry a watch, and in any case — who cares; but waking refreshed, I continued on my journey and in due time reached my camp still with light to spare. No amount of money would entice me from this. I wonder if I've gone completely wild?

To continue with my funny ways — when camping out — a big green leaf, plucked from a nearby bush makes an admirable pot-holder when handling a hot tea pail. Earth from the creek-side takes the place of saps. All living things are dependent on each other — that much have I learned in my solitary endeavours — yet man seems bent on destroying every species he doesn't have a need for. We'll pay, sooner or later.

In the spring, my body craves greens and what better herbage than dandelions — they're simply chock-full of all the goodies necessary for health and vitality — and anyway, they're the first to appear in my neck of the woods. From then on, there's one kind of wild edible after another, plus the garden, to keep one fit as a fiddle.

So I'm eccentric — but do I wish I was someone else? — NOPE: Some folks race cars, others play or watch sporting events — I prefer to walk in uninhabited regions. I'm addicted to wild places. When I step off a trail into the unknown, my spirits soar — hinterland, questing — marveling (being the first human being to walk on a piece of ground never ceases to be a most humbling and wonderful sensation) until sanity prevails and I return to the **real** world — one of hate and discord.

Not wishing to end on such a sour note —. Yesterday I saw a humming bird feeding at fireweed blooms, Whoops — this was after I spied a fox trotting from woodpile to stable to woodpile, sniffing like mad. He finally caught a mouse on the manure pile. In all this time he seemed not to have detected my motionless figure.

Behind me Mike Ferguson stirred and broke into our reverie with, He'll be a while yet, so I'll put on a fire and get breakfast started''.
Mike has slept in the cabin — door wide open — while Fred, whose cabin is about a mile up the valley, and who could have used the other bunk — instead brought his sleeping bag out here to join me in the chip - strewn yard where several inches of sawdust (years of woodcutting) made an admirable bed on such a warm spring night. Pulling on socks, pants, boots, shirt — Fred also repaired to the house where sounds of Mike poking the kitchen stove to life, could be heard. I dressed immediately then sat on a chopping-block listening to the distant complaining roar, which never seemed to get any nearer.

Time drags — muffled voices issue from the cabin 'throw in a couple more handfulls of oatmeal' — a rabbit drops slowly through a splash of yellow cast by the coal-oil lamp, from the open door. Tea water hissing and bubbling become audible just as Mike and Fred emerge to wait-up John's arrival with me.

Finally — suddenly — headlights bloom as the truck crests the rim, turn and comes slowly towards us over the far field, following the tracks, crossing the log 'bridge' over the creek (down about two hundred yards) and the last leg, swinging our way again to grind steadily up the hard-pan 'driveway' to halt just below us on a little flat.

Switching off — alighting — stretching — a smile of greeting and — 'You weren't kidding, that's some hill — I don't think you'll be bothered much with traffic — do I smell breakfast?

In that extra quiet period just before dawn, sharp creaks from the cooling engine, now and then puctuate startlingly, the soft 'roar' of anxious honeybees and four 'characters' in another world entirely (as I said at the beginning) silently wade through a prodigious meal. How different is my life? Well, over tea a little later I casually let drop — 'Can you picture me, or any of you, in a suit and tie and low shoes in town and perhaps toting a brief-case with a . . . .'. But I didn't get time to finish, for all three of my companions broke into sudden laughter, which I say — none of us here are part of the 20th century, and in spite, or perhaps because of that — among the luckiest folks in the world.

A couple of days later we (my son and I) paused before dropping out of sight onto 'Mile Hill' on our way home; Looking back I thought — 'there's the cabin, a tiny haven of peace and tranquility, unkown to all but us four. The mountains — where great rivers begin; And beyond that, the sea. Can you get anymore 'End Of The Road' than that?'□

Beekeeping At West Virginia University

By BARD MONTGOMERY, State Apiarist
West Virginia

"Assigned Topics in Entomology 180-B (4 credits)" — From the title alone, one would not be able to guess that beekeeping is on the curriculum at West Virginia University's College of Agriculture and Forestry. Since 1978, the beekeeping course has been offered in the January-May semester, giving college students an introduction to the topic. This course is evenly balanced among theory and practice, lecture and laboratory.

About 20 students enroll each time the course is offered, according to Dr. James W. Amrine, who teaches it. "Most of the students are in the agricultural college," say Amrine, "but we have students coming from all the colleges, including music majors who are interested in bees."

The students get practical training in equipment and assembly and colony

PHOTO 1. Dr. James Amrine maintains a year-round observation hive in the university's honey room.

management in the university's 16-colony apiary and in the honey room, where a small extraction facility is located. The honey room is in the same building that houses the college's dairy plant. The milk and honey departments teamed up in the summer of 1982 to prepare honey ice cream for the enjoyment of 600 beekeepers who attended the Eastern Apicultural Society Conference in Morgantown.

College-level instruction is not limited to such practical topics as honey processing and control of bee diseases, according to Dr. Amrine. "We give a lot of attention to the anatomy and physiology of the honeybee," he says, "and one of the most

PHOTO 2. The university is situated on a bluff overlooking Morgantown. Experimental Kenya hive is on the left.

interesting parts of the course is about bee navigation." The ways in which scout bees are able to find nectar bearing flowers and report their locations to other bees in the hive was first investigated by Dr. Karl von Frisch in the 1920's. Von Frisch's research is regarded as a major development in the science of animal behavior and won him a Nobel Prize.

Amrine's students attempt to duplicate some of von Frisch's experiments in April, when nectar and pollen foraging accelerates. Individual bees are marked and returned to an observation hive. When returning scouts begin their "nectar dance", their orientation on the comb is carefully observed and interpreted according to the von Frisch theory, which predicts the direction and distance from the hive of the food source. The theory can be confirmed by traveling to the predicted spot to recover marked bees.

In past years, the bees were also given a specific job to perform in April. At that time, they were trucked to the university experiment farm at Kearneysville, in the heart of the Shanndoah Valley apple belt. Like commercial orchards in the area, the university farm depends on managed honeybee colonies for pollination of apple blooms opening in late April and early May. Moving the hives from Morgantown to the Eastern Panhandle and then back again proved to be inefficient, however. This past spring, the Morgantown colonies were split, and some of the division were used to establish permanent colonies at the Kerneysville farm.

PHOTO 3. "Final exam" for WVU honey is administered by students who brought homemade bread and biscuits to class.

The univeristy never lacks for bees, says Dr. Amrine, who gets plenty of phone calls in the spring to come and retrieve swarms that are spotted by anxious homeowners.

As its principal text, the course uses "*The Hive and the Honeybee*", published by Dadant & Sons. Amrine also praises "*The Beekeepers Handbook*" by Sammataro and Avitabile, for its treatment of the physiology of bee sting reactions. Both books are available from the major bee supply firms and from many local supply dealers. The university's agricultural library also has a complete set of *Gleanings In Bee Culture* and *American Bee Journal*, dating back to their first issues in the mid-1800's. Issues from recent years are in bound volumes on the shelf. Older issues are available on mircrofilm.□

Obituaries

J. Alex Munro

J. Alex Munro, 88 of 304 Saxon Drive died at 11 P.M. Thursday at his home.

he was born in Embro, Ont., Canada, a son of James and Chatherine MacMurchy Munro. Mr. Munro received his doctor's degree in entomology from Cornell University and served as professor and chairman of the Department of Entomology at North Dakota State University in Fargo. He later served as an entomologist with the U.S. Government Foreign Services in Bolivia, the Phillipines and Lebanon and at the Los Angeles State and Country Arboretum.

NEWS AND EVENTS

Cornell Short Course

The annual Cornell University Beginning Short Course in Beekeeping will be held on the Ithaca, New York campus on July 13-15, 1984.

The course will include lectures, demonstrations and an opportunity to open colonies under the supervision of practical beekeepers. The course starts with movies Friday evening and continues all day Saturday including a dinner and speaker Saturday evening. The couse will conclude about 3:00 p.m. Sunday.

Instructors will include Professor Roger A. Morse, Cornell Graduate Students and two commercial beekeepers, one of whom migrates with his bees between New York and Florida.

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 total cost will be about $100 per person. This includes a single room for two nights, three meals on Saturday and two on Sunday, all instruction materials and the advance registration fee of $15.00. Double rooms are $5.00 less per person. Full linen service is provided. Registration forms may be obtained from: Office of Apiculture, Department of Entomology, Comstock Hall, Cornell University, Ithaca, NY 14853. If necessary to phone, call (607) 256-5443.

EAS

RHODE ISLAND

A picturesque Rhode Island beach, one of many to be found on Rhode Island's 400 miles of waterfront. Washington County, commonly referred to as South County, is the site of several such beachs; all a short driving distance from the University of Rhode Island, sit of the 30th Annual Eastern Apicultural Society Conference August 8-11, 1984.

OREGON

Oregon Agricultural Groups were invited to the Clackamas Town Center on March 17 and 18th to set up displays of their product for educational purposes. Oregon State Beekeepers had an excellent area which drew a large crown with an observation hive brought by Frank Shininger of Portland. Virgil and Karalee Charriere of Banks manned the booth, answering questions and explaining different facets of beekeeping. 1984 Oregon Honey Queen Joan Heather and Princess Dana Field were there to talk to the public and offer samples of honey, explaining different nectars. Dana Hedum, Oregons' 1983 Queen was also there to give a helping hand.

Delaware Valley College Spring Beekeeping Short Course

Delaware Valley College Doylestown, PA hosted its annual three day beekeeping short courses. The age of those kids taking the course ranged from seven years to a number of septuagenarians. They came from all walks of life, and the majority of those in this year's course were either just getting started in beekeeping or contemplating getting started in beekeeping.

The instructional staff included Mr. Bob Berthold, Delaware Valley College's beekeeping specialist; Mr. Jack Matthenius, N.J. Supervisor of Bee Bulture; Mr. Paul Cummings, the grand "old" man of Pennsylvania Apiary Inspector and Mr. Frank Mikowski, commercial beekeeper. Mrs. Marnie Berthold also presented an illustrated talk on home uses of honey followed by the sampling of her homemade honey baked goods.

Delaware Valley College will be offering its Summer Beekeeping Short Course on Friday, Saturday, and Sunday, June 22, 23, and 24, 1984. Additional information can be obtained by writing Dr. Berthold c/o Delaware Valley College, Doylestown, PA 18901 or by calling him at 215-345-1500.

Melissa Hart of Watertown, Tennessee was selected as first runner-up in the National "Miss Agriculture" contest held in Chicago this past March. Melissa entered competition as American Honey Queen from the American Beekeeping Federation. We're all proud of Melissa and the job she has done representing beekeeping.

Rutgers Beekeeping Short Course

Rutgers University will again be offering its ever popular three day beekeeping short course. Probably one of the oldest con-

Continued on next page

tinuously offered beekeeping short courses in the country, this course has attracted people from all walks of life, people of all ages, and people from all over the United States and from many foreign countries. The beekeeping background of those attending has ranged from rank novices just contemplating getting into beekeeping to commercial beekeepers.

This year with Dr. Rad Roberts, Rutgers' Beekeeping Specialist being away, the course will be under the direction of Mr. Jack Matthenius, the New Jersey Supervisor of Bee Culture and Dr. Bob Berthold, Delaware Valley College, pennsylvania's Beekeeping expert. Emphasis will be mainly on the practical aspects of beekeeping with discussions and demonstrations in the classroom and laboratory and hands on experience in the field.

The dates for the course are Wednesday, Thursday and Friday, June 27, 28, and 29, 1984. Additional information and an application can be obtained by writing or calling Mr. Ned Lipman, P.O. Box 231, New Brunswick, NJ 08903 or by calling 201-932-8996.

Illinois State Beekeepers' Association "SUMMER MEETING"

Hosted by
MISSISSIPPI VALLEY
BEEKEEPERS' ASSOC.
Qunicy, Illinois
Saturday — June 9, 1984

The meeting will be held at the Farm Bureau Building in Quincy, Illinois located two blocks south of Broadway on 36th street.

Registration begins at 9:00 a.m. with the meeting starting about 9:30 a.m.

Mississippi Valley Beekeepers — "Welcome and Introduction of ISBA Officers".

Mr. Robert Holloway, President of ISBA "Insights of our Prospects in the Beekeeping Industry".

Dadant & Sons, Inc. — "Equipment & Gadgets — Old & New" — and a display of books and equipment.

Mr. Lloyd Lindenfelser, retired chemist, USDA Laboratory Peoria and director ISBA Central Zone — "From the Blossom to the jar to the Consumer".

Mr. Eugene Killion, Supervisor of Apiary Inspection and Beekeeping Specialist for the University of Illinois — "Roving about Illinois North to South & East to West".

Mr. Larry Fischer, Director of Ag. Program, John Wood Community College, Quincy — "American Agriculture Today".

Other speakers to be announced at meeting.

The ladies will have a tour of some of Quincy's Historical sites or will have demonstration on crafts of sort.

The noon meal will be on your own, a map of nearby restaurants will be on hand at the meeting.

For those of you coming a long distance, Dadant & Sons in Hamilton is about 35 miles from Quincy. If you come Friday for supplies and plan to stay overnight for the meetings on Saturday, there are various motels and campgrounds in the area for your convenience.

Eastern Missouri Beekeeper of the Year for 1983

The Eastern Missouri Beekeepers Association recently named Larry Hensley as The Beekeeper of the Year for 1983. Mr Hensley has been a beekeeper for 10 years and operates over 80 colonies. He has served the organization in many capacities over the years. Mr. Hensley's main contribution has been as treasurer, since 1978, and editor of the monthly newsletter, since 1980.

The photograph shows Larry Hensley (on the left) being presented the Eastern Missouri Beekeeper of the Year Award for 1983 by E.R. Kaufman, past president and Beekeeper of the Year for 1982.

Annual Beekeeping Short Course

The annual beekeepers short course for beginners and more experienced beekeepers will be held on June 16 at the University of Georgia, Athens, Georgia. The meeting, which is sponsored by the Department of Entomology and the Georgia Beekeepers Association, will be from 8:30 a.m. to 4:30 p.m. Registration will start at 7:30 a.m. at the Chemistry Building Auditorium. Demonstrations of practical beekeeping will begin at 1:30 p.m. at the University Apiary on the Horticulture Farm located on Highway 53, six miles south of Athens, Georgia.

Topics and demonstrations will include honey bee biology and behavior, bee diseases, management for honey production, colony division, honey house operation, queen finding and requeening, two-queen colony system, and package bee installation.

The teaching staff will consist of several honey bee specialists, including well known commercial honey and queen and package bee producers from Georgia. The course fee is $20.00 per person. Advanced registration is requested by June 14, 1984.

Requests for additional information, program and registration forms should be addressed to Dr. Alfred Dietz, Department of Entomology, University of Georgia, Athens, Georgia 30602 or telephone (404) 542-2816 or 542-8711.

MONTANA

The items below summerize both recent and past and upcoming activities of the Eastern Montana Beekeepers Association.

The MBA is affiliated with the Western Apicultural Society and has been active in recent years promoting hobbyist activities in south-central and eastern Montana. They have had an information booth at the Yellowstone Exhibition, a major fair at Billings, Montana each August, where beekeeping items and an observation hive are displayed, also cooking tips and recipies using honey are handed out. In 1983 the Association sponsored the firt honey show and sweepstakes competition at the Fair. Plans are underway to include live beehive demonstrations at this years exhibition.

The Association meets the second Wednesday of each month and currently has members from five countries in south—central Montana. This years activities include a series of workshops to help new and novice beekeepers get started and provide a format for the more advanc-

Continued on next page

ed beekeepers to exchange ideas.

The EMBA is also trying to develop a Beekeeper Certification program to provide recognition to members of their acheivements and advancements in beekeeping skills. If any other associations have such a program now, the EMBA is asking for ideas and help in getting this program started. Information and plans can be sent to EMBA President Steve Lundin, Route 1, Shepherd, Montana 59079.

ing fund for winners. "Only one essay from Wisconsin can be submitted to the national competition," says Gojmerac. "We hope to build a fund so we can use money in the fund to give a cash award, not only to this individual, but to the second and third place winners."

Groups or individuals interested in contributing to the fund can contact Gojmerac at 237 Russell Labs, University of Wisconsin-Madison, Madison, WI 53706,

At the March meeting Ray Degenhart, of Billings, Montana, received the "Beekeeper of the Year" award given by the Eastern Montana Beekeepers Association. Mr. Degenhart was the Associations President in 1983 and co-ordinated the groups of organization of, and sponsorship of the first Honey Show at the Yellowstone Exhibition Fair at Billings, Montana in August 1983.

Mr. Degenhart, Center, holds the engraved, chrome-plated hive tool that symbolizes the award. On his right is Albert Bell, of Billings, Montana, the 1982 award winner, and on his left is Steve Lundin, of Shepherd, Montana, the Associations 1984 President.

WISCONSIN

Outagamie County Beekeepers Association Contributes to 4-H Fund for Beekeeping Essay Winners

Outamie County Beekeepers Association of Appleton, Wisconsin, recently contributed $25.00 to the continuing fund for Wisconsin award winners of the American Beekeeping Federation's 4-H contest.

"Each year, the American Beekeeping Federation sponsors an essay contest for 4-H Club members," explains University of Wisconsin-Extension Entomologist Walt Gojmerac. Dollars contributed by Wisconsin beekeepers will go toward a continu-

or send a check, payable to the Wisconsin 4-H Foundation, 328 Lowell hall, 610 North Langdon Street, Madison, WI 53703. Be sure to indicate that the check is to be used to support the beekeeping educational programs.

KENTUCKY

The Virginia State Beekeepers Association again will conduct a Beekeeping Conference this summer at Eastern Kentucky University in Richmond, Kentucky. Dates and program will be announced as soon as it is determined.

NEW YORK

The DeWitt Historical Society of Tompkins County and the Hinckley Foundation Museum, both in Ithaca, have been awarded a $5,365 grant by the New York State Council on the Arts to research and interpret the history of medicine in Tompkins County.

This collaborative effort will examine the roles of orthodox medicine and medical education as well as alternative medicine such as the homeopathic school, folk or home remedies, and patent medicines in the 19th century. The research will result in exhibits at both museums, a catalogue, and a lecture series beginning in July.

Both museums are eager to hear from people interested in the history of medicine in Upstate New York. If you have suggestions to make or if you collect medical artifacts, please contact Gretchen Sachse, Historian, DeWitt Historical Society, 607-273-8284.

Eastern Pennsylvania Bee Meeting Set

On Saturday, June 16, 1984, Delaware Valley College in conjunction with the Bucks County and the Montgomery County Beekeepers Associations will be hosting their Annual Summer Meeting.

The featured speaker for the meeting will be Dr. John Vandenberg of the United States Department of Agriculture Beltsville Bee Laboratory. Dr. Vandenberg will be presenting a workshop program on the adult honey bee disease nosema. He has presented a number of similar workshops in the past on this topic, and his presentation promises to be interesting and informative. Dr. Vandenberg's workshop will begin at 1:30 p.m.

Preceeding the formal part of the meeting, Saturday, and starting at 12 noon beekeepers and their families are invited to bring along picnic lunch and to meet in front of Mandell Hall on the Delaware Valley College campus to enjoy the beautiful campus and to enjoy the fellowship of other beekeepers.

Following Dr. Vandenberg's workshop, there will be an open house at the College's apiary and honey house with opening of hives and refreshments scheduled.

Delaware Valley College is located in Doylestown, PA on Route 202 which is easily reached from most parts of Eastern Pennsylvania, New Jersey, Northern Delaware and Northern Maryland.

Starting on the following Friday, June 22, 1984, through Sunday, June 24, 1984 Delaware College will be presenting its popular Summer Beekeeping Short course.

Additional information about either or both of the above events may be obtained by writing Dr. Berthold, Delaware Valley College, Doylestown, PA 18901 or by calling him at 215-345-1500.

PENNSYLVANIA

Lehigh Valley Beekeepers Association is proud (and pleased) to announce Dr. Richard Taylor noted Author, Teacher, Lecturer and Columnist for *Gleanings In Bee Culture* will be our Speaker July 25, at 7 p.m. March this on your calendar and plan to attend. We've promised him a large turnout, so don't let your club down.

Continued on next page

Dr. Taylor's books will be available for purchase — and autograph, too, We will also be chancing off a Ross Round Super that evening. Tickets available at all meetings between now and July 25. Priced at 2 for $1.00, non-winning tickets will be held for our club hive drawing in September.

PENNSYLVANIA
Honey Queen

Meet Pennsylvania's Honey Queen for 1984—Miss Martha Herr! Martha was crowned as the state Honey Queen in November 1983 at the Pennsylvania State Beekeepers Association Winter Banquet in Dillsburg. Martha's reign officially started on February 1, 1984 and will promote HONEY and BEEKEEPING industries throughout the state until January 31, 1985.

Martha is the daughter of Willis and Martha Herr of Lancaster, Pennsylvania. She became interested in bees and honey through her grandfather, Robert C. Herr, who owns an apiary of good size.

Miss Herr's official duties will include promotions at fairs, malls, speaking at civic organization functions, and on radio and television. She will be the reigning Honey Queen at the state's 1985 Farm Show in Harrisburg. Then its off to Tampa, Florida to compete for the title of American Honey Queen!

KENTUCKY

The Kentucky Beekeeping Association will conduct a beekeeping summer seminar from 5:00 p.m. July 19, all day on the 20th, until noon on July 21st. A nominal fee will be charged for admission. The conference will again be held on the campus of Eastern Kentucky University at Richmond, Kentucky.

All interested persons invited.

These beekeeping lectures, displays, and demonstrations have been very popular in the past. Again this year, an experienced beekeeper will demonstrate how he "grows" a bee beard, then removes it by "shaving" the bees from his face.

MAINE

On the occasion of its Eighth Annual Meeting, at the New Meadows Inn in West Bath Saturday, March 31st, the Maine State Beekeepers Association elected Ruth Knippa of West Bowdoin as its sixth President. A former director of the Association and a 1982 President of the Cumberland County Chapter, Mrs. David Knippa is a beekeeper herself of several years standing. Also elected were Joseph Martston of Dryden, Vice President, Frank Bruton of South Windham, Treasurer, and Elizabeth Pritchard from Readfield, Secretary.

Contacted shortly after being elected Mrs. Knippa said that her aims for the near-500 membership Association included increased emphasis on **education,** not only for the members themselves but also for the general public.

The slate of officers also elected included the following directors: John Thomas, Phillips; Frank Ober, N. Whitefield; Don Harris, Waterville; Stanford Brown, Cumberland Center; and Tom Sholl, Belgrade Lakes. Representing both commercial and hobbyist beekeeping interests this panel brings to the Maine Association considerable expertise gained from years of experience.

CALIFORNIA
1984 Western Apicultural Society Conference in California

The annual Western Apicultural Society Conference will be held this year on August 20-25 on the campus of the University of California at Davis. WAS was organized at Davis in 1978 to provide hobby beekeepers with an enjoyable annual conference where they can obtain up-to-date beekeeping information from professionals at the university and within the industry.

There will be FUN AND ENDLESS "BUZZING" BETWEN OLD AND NEW BEEKEEPING FRIENDS! And, as usual, there will be new things to enjoy. President Eric Mussen and Program Chairman Norm Gary guarantee some surprises for you! This year's program is different from previous conferences in several respects. There will be plenty of free time during the meeting for visiting with your friends and enjoying the exhibits. And there will be excellent entertaining and educational presentations by some of the best bee authorities in the West.

Two afternoons will be devoted to a great variety of practical, down-to-earth demonstrations conducted at the University's Bee Biology Facility, the most unique beekeeping research facility in the West. You'll have the opportunity to see the largest collection of bee books and publications in the Wet. And there will be several special events where your "spirits" will be elevated to your complete satisfaction . . . it is rumored that home-made honey beer (root and regular) will be a special treat. You'll enjoy the informality of a cook-out and a Western Bar-BEE-cue buffet-style banquet with a lively Dixie Land Jazz Band from Sacramento, the western capitol of Dixie Jazz. Yes, there will be some fancy dancing, better than the wag-tail dances of bees! Local transportation will be a genuine double-decker London bus imported from England for campus transportation.

Demonstrations will include instrumental insemination of queens, witnessing drone matings at a drone congregation area, bee training, a beginners session on how to prevent stings, (and if that fails then we'll demonstrate how to remove stings!), new queen-finding methods, new queen rearing techniques, queen introduction, honey production and packaging ideas, beeswax uses, many research projects, the greatest bee beards you ever saw, and much, much more.

Continued on next page

Commercial exhibits this year should be outstanding! Expect to see all kinds of beekeeping supplies, and new gadgets and ideas for making your beekeeping easier, more profitable, and enjoyable.

Some of the latest in research advantages will be demonstrated, including the Gary-Lorenzen Queen-Finding machine, recently patented and soon to be marketed. And we'll demonstrate a new queen-finding gadget for the hobby beekeeper.

Eric Mussen will display new kinds of bee hives. New applications of computers for bee research will be shown too . . . bet you didn't know we can now use voice commands to talk to the computer so it can record bee activities! On display will be pollen traps, dead bee traps, all kinds of special cages for queens and bees, and anything else we're lucky enough to invent before next August.

Our speakers this year are the best, including editors of bee journals, scientists with a sense of humor (including the one and only Michael Burgett, Oregon State University), a behind-the-scenes look at commercial queen and package bee production by one of the largest commercial producers in the world (Wenner Honey Farms, Inc.), a specialist in nectar plants (Yvonne Donner), and many other experts to field your questions about beekeeping problems.

We're putting together an evening show which includes outstanding films and recent television appearances featuring the honey bee (shows that you always seem to miss). There will also be a showing of rare and historically important graphics from the Marple Apicultural Graphics Archives, shown by Richard Marple (if you're lucky you may acquire one of these works.... . . a few are for sale). Otherwise, you're almost sure to win some valuable door prizes, or some of the raffled goodies.

There will be exhibits by beekeepers who will display their best honey, beeswax, gadgets, honey cookery, mead, etc. as they compete for blue ribbons to take home. Anyone who is a member of WAS may submit entries.

If you still aren't convinced, the following should do it! Davis is only 15 minutes from Sacramento. You could easily spend a week there trying to see outstanding attractions such as the Old Sacramento Historic Area, which includes the California state Railroad Museum (one hundred thousand square feet of historic locomotives, railroad cars, and railroading exhibits) and many other famous old museums and building dating back to the gold rush days. Sutter's Fort is a page out of the old West history book! And the grandeur of the California State Capitol building, after seven years of restoration, is breathtaking. We also arranged for the California State Fair to be in full swing too! So plan to spend a few days before and/or after the conference in the Sacramento area. If you want cooler climes you can head for San Francisco (90 minutes from Davis) or go to the Sierra Mountains (a two hour drive) to see beautiful Lake Tahoe and to take you chances in the land of casinos (go there **AFTER** the conference please, not before).

For REGISTRATION INFORMATION please call 916-752-2815 or write to Campus Events and Information Office, University of California, Davis, CA 95616. or JOIN WAS NOW and you will automatically receive all the information you need. To join, request a membership form from Zandy Neese, WAS Secretary-Treasurer, 711 College, Woodland, CA 95695 Ph: (916)-661-3659.

Workshop at the W.A.S., 1983 Conference.

Indiana Apicultural Leadership Conference

Back Row: Dave Laney, carl Olsen, Steve Welch, Don Stoelting, Larry Tutteron, Gus Flassig, Bob Dybicio. Center Row: Frank Weatherholt, Joe Miko, Phil Juengl, Randall Thompson, Jim Adams, George Thomas, Mrs. George Thomas. Front Row: Ray Hampton, Bill Frosch, John Heskett.

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

The INTERNATIONAL BEE RESEARCH ASSOCIATION urgently needs your membership and support to continue its work of publishing informatin on bees, beekeeping and hive products. Write for details about publications and the benefits of membership to USA Representative, H. Kolb, P.O. Box 183, 737 West Main, Edmond, OK 73034 (phone (405) 341-0984); or to IBRA, Hill House, Gerrards Cross, Bucks SL9 ONR, UK, regularly publishes new information on bees, beekeeping, and hive products, for beekeepers and scientists all over the world. Mail inquiries from USA: H. Kolb, P.O. Box 183,, 737 West Main, Edmond, OK 73034, Phone: (405) 314-0984. IBRA PUBLISHES: **Bee World,** a quarterly journal for the progressive beekeeper. **Apicultural Abstracts,** a survey of scientific literature from all languages. **Journal of Apiculture Research,** for original bee research papers. Books and pamphlets on all beekeeping topics. Catalogues of publications and details of journals and membership $1. Specimen copies of **Bee World**; **Journal of Apicultural Research** or **Apicultural Abstracts** from INTERNATIONAL BEE RESEARCH ASSOCIATION, Hill House, Gerrards Cross, Bucks. SL9 ONR, England. TF

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

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

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

BEE CRAFT — Official (monthly) magazine of the British Beekeepers Association. Contains interesting and informative articles. Annual Subscription $5.10 (Surface mail) and $7.10 (Airmail). The Secretary, 15 West Way, Copthorne Bank, Crawley, Sussex, RH10 3DS TF

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

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

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Hawking Honey

By JOAN MANES OLSTRUM 3164 Maple Court Reedsport, OR 97467

How many times have you seen a peddler or hawker parked along side a road, selling his/her wares? Ever wonder what's involved?

Webster defines a peddler as one who sells or dispenses in smalll quantities while traveling about, engaged in a small business. A hawker retails or tries to sell by crying in the street. "Crying" in this case probably means calling, shouting, talking loudly—not tears!

In some states you may be able to "set-up shop" anywhere along the highways and byways of the area. But not in Oregon! Permits and fees are involved. Thank goodness there's no sales tax out here (yet!); I think that would be a **real** headache.

Just for kicks I started investigating how to go about the whole affair. First I'd been told by one peddler that "all you need is a state peddler's license." So I called up. Oregon has a "Need Help?" phone number at the state captiol.

After several dead ends — through the Department of Commerce and Permits and, and, and—I finally was referred to the State Police. They assurred me that there was no peddler's permit and that it was NOT legal to set-up along the highways—**unless** I was on private land, with the owner's permission. In fact, doing it on state right-of-way (along highways) would (could) result in a warning and perhaps even a $500 fine.

Still, I was seeing (brave?) folks selling their wares along side the highways in the country and even in our city—a asmall coastal community of 4800. It must pay because the sellers kept returning; either that or they've nothing else to do.

One local gas station, well situated on Highway 101 between two major grocery stores had a regular hot dog peddler and a weekly (summer-fall) fruit-vegetable seller. I contacted the owner who suggested I join the next door lot. But did I have my city hawker's license??

The city informed me that my already pruchased city business license, state inspected weights and measures and food processing licenses, etc. etc. were NOT enough. I'd also need a Hawker's license! Another $10 to put out! At least that is good for a whole year; peddlers from out of our taxing district need to purchase a $10/time license **and** put up a $1000 bond with the city!

So I joined the parking lot crowd. The items needed — besides lots of honey (think positively!) are a table and stool, sunglasses and suntan lotion, lots of change, paper bags, free recipes if you give them out, a book to read just in case business is slow, a thermos of lemonade and a sandwich to stave-off starvation, and a big sign that people can read far enough away to screech to a half from the 35 mph (or what-ever) limit. And—for heaven sakes—keep back on the private land—off the state highway's right-of-way!

Why did I decide to do this crazy stuny? Fresh air is nice but I can get this beekeeping. I've got a honey room in our basement—but we are off the beaten path, at the end of a dead-end side street; folks rarely accidently dirve by. I wanted some public exposure, that's why! Something in addition to classified ads. Something besides all the educational exhibits I put up at the library or the hanks or the talks at the churches, schools, clubs.

I want people to get the message (by repetition) that here I am with the World's Best Honey (sorry about that, all you other beekeepers!) looking for customers.

Okay, folks, line forms at the rear! Come 'n get some De-lish-us real Bee-Made Raw Oregon Honey! (And a little PR on bees too, if you're not in too much of a hurry).

Note: I hawked a few afternoons in the fall of 1982 and sold $30-50 of honey in an afternoon. A doctor bought the vacant lot in 1983 and is building a clinic. That ended my career as a hawker.□

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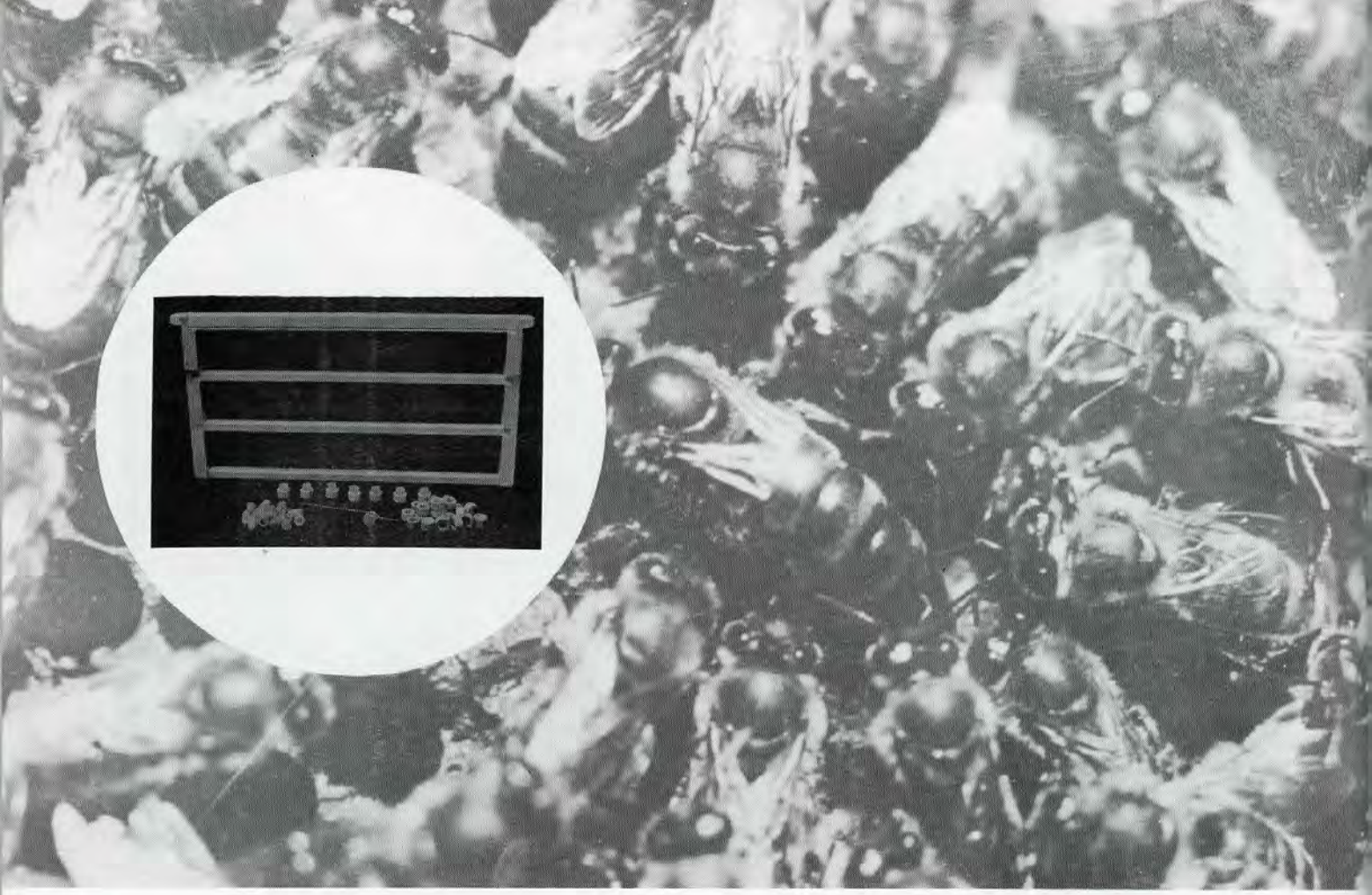

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