Fall 2005

W.A.S. Journal

The Journal of the Western Apicultural Society of North America

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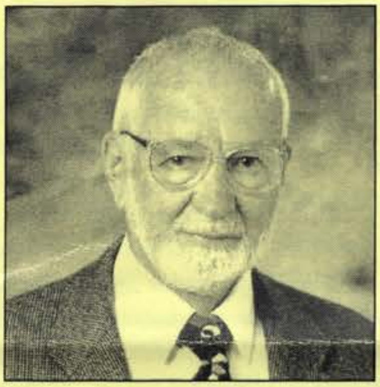

Message from the President

Yes, you read it right in the last W.A.S. Journal. July 2006 (24th -27th) will find our annual conference at Pea Soup Andersen's Conference Center in Buellton, California. Whereas Santa Barbara proper has become too expensive, Buellton is an ideal location in many ways. By arriving a few days early and/or staying a few days after the conference, you can enjoy the Santa Barbara area without excessive expense.

A very short drive east from Buellton on Hwy 246 brings one to the faux Danish town of Solvang, with its windmills and tourist shops. After a short drive further east you can visit the Chumash Casino or take Hwy 154, a route that winds past Lake Cachuma and leads to Santa Barbara.

You can go more directly to Santa Barbara from Buellton by driving less than 40 minutes south on Hwy 101. I see little need here to explain what one can find in Santa Barbara, with its historic mission and courthouse, waterfront area (with wharf, spectacular new Sea Center, and whale watching cruises), native plant botanic garden, natural history museum, or its many restaurants and Chase Palm Park with its fine antique carousal.

Alternatively, you can head west from Buellton on Hwy 246 and drive through the vast flower fields of Lompoc, a village made famous by W.C. Fields (check out "Lompoc W.C. Fields" on Google). By going further west you travel through Vandenberg Air Force Base and reach the non-town of Surf. By walking over the railroad tracks at Surf, you reach the Pacific Ocean. You have to be careful, though, to tread lightly so as to not disturb nests of the snowy plover (heavy fines).

From Lompoc you can also drive south a few miles on Hwy 1 to the Jalama Beach junction on the right (look closely). A winding and picturesque road leads to Santa Barbara County Jalama Beach Park, a place known only to a few who like to get away to a truly isolated beach, known to the locals for its excellent surf. (If you could get in a boat there and head due south, the first land you would encounter would be the Galapagos Islands!)

From Buellton you can reach the ocean much quicker by driving a mere five miles south on Hwy 101 to the Gaviota Beach State Park, with its campground and pier. If you would like to camp there you must make reservations very early for a campsite (type "California State Campgounds" into Google to learn more). If you are into fishing, you can fish from the pier (but not from the beach) without a fishing license.

If you prefer mountain country, the vast Los Padres National Forest and wilderness areas stretch eastward through most of Santa Barbara and Ventura Counties. You can go a relatively short distance to nearly mile-high Figueroa Mountain for a spectacular view of the region (check out "Figueroa Mountain Santa Barbara County" on Google).

Last, but certainly not least, Buellton is near the center of a now famous wine growing area ("Sideways" country of movie fame), with some three dozen wineries within easy driving distance. We should be able to arrange a wine tour for those interested.

By the time you read this, Eric Mussen and I will have met at the California Beekeepers Convention in South Lake Tahoe, where we will have worked out more of the details for our forthcoming conference. Among other possibilities: we have in mind a post-conference whale-watching tour out of Santa Barbara Harbor. Chances are quite good that you would be able to see blue whales, the largest animals ever to live on the earth!

Adrian M. Wenner

Western Apicultural Society of North America

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Each state/province in Western North America is entitled to elect one Director to the governing board of the Society. Directors meet before and after each general meeting and set policy and guidelines for the operation of the business of the Society. Throughout the year, they serve as the liaison between the Society officers and the members in their respective states/provinces. They are responsible for recruiting new members, keeping track of state/provincial concerns and advising the membership of their activities through this Journal.

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The Third European Congress on Social Insects

By Dr. Adrian Wenner

A year ago I received a surprise -- an invitation from Prof. Vladilen E. Kipyatkov of St. Petersburg University in Russia. He requested that I give a plenary lecture on honey bee recruitment to crops ("Odor and honey bee exploitation of food crops") and participate in a symposium on varroa mites ("The exciting potential of remote feral bee colonies for Varroa coexistence") at the Third European Congress on Social Insects, to be held in that city at the end of August this year. Of course I agreed, that invitation ending a long dearth of such invitations to participate in major conferences.

Preparation amounted to a great deal of work. All presentations had to be in PowerPoint, which I had never used before. That meant that I had to have slides scanned, a process that didn't work for existing line drawing slides (too thin an emulsion). My computer needed more memory, and the software needed upgrading (which I got a 9th grader to do!). Getting a Russian visa was no easy task, either. Rubles and EUROS had to replace U.S. dollars, but the local banks didn't have any rubles (Russia doesn't want stores of their currency in such places).

Since the congress included all social insects and not just honey bees, quite a diverse group of scientists participated from countries as far away as Australia. Topics ranged from learning and behavior (e.g., memory, "cognition," perception, vision) to colonies (e.g., themoregulation, swarming, division of labor, diseases & parasites, foraging & recruitment) to wider topics (e.g,, genomics, ecology, evolution, conservation, internet impact on information exchange).

A further distinction became apparent when the organizers made me keynote speaker.. My talk seemed to go well that first morning. At the break I asked a woman from the Ukraine why they had made me first speaker. She replied, "Why, you are famous in Russia! We have translated all your papers into Russian, and we use your papers in our classes as examples of how experiments should be run." I was floored!

Upon returning to the U.S., I furnished a copy of the Proceedings to Eric Mussen and Robbin Thorp of the U.C. Davis campus. Eric has now printed his summary of those proceedings in his Apiculture Newsletter. You can access that summary at entomology. ucdavis.edu/faculty/mussen.cfm. Click on the appropriate online link ("Apiculture Newsletter") and then single out the September/October issue under "Topical Index."

Malcolm (Tom) Sanford also attended the congress and has provided a first hand coverage of the proceedings in a three part series for the American Bee Journal. The first part appeared on p. 913 in the November issue. The second and third parts will appear in subsequent issues.

Queen Behavior & Replacement

By Dewey M. Caron, University of Delaware

The queen is the bee colony egg layer and producer of the primary pheromone queen substance, the "social glue," that identifies her and her colony. Usually there is only one queen, but the mother-daughter 2-queen colony that occurs following successful supersedure is more common than we realize. The queen holds the entire DNA library in her ovaries (egg production) and spermatheca (sperm stored from a dozen or so drones with which she has mated). She will "reign" several months to a couple of years.

Queens, like the workers, start as fertilized eggs. They pass larval development in vertically hanging cells, an important signal to nurse workers of a queen being raised. The queen-to-be receives the nutritionally richer and quantitatively greater diet of royal jelly, passing from egg to adult in a mere 16 days (a day sooner in tropical bees). Upon emergence as the adult, the new [virgin] queen must dispatch her rivals and mate before she assumes her egg laying/pheromone dominance.

The mated queen intersperses egg laying with resting behavior. She measures cell opening diameters before release [small diameter], or not [larger diameter], of sperm as her newly produced eggs pass the valvefold area of her oviduct. Up to a dozen sperm are released from action of a small spermathecial duct gland before the eggs pass into the sting chamber; only one sperm enters tiny opening in the egg to unite male sperm nucleus with female egg nucleus. The fertilized egg begins zygote development and cell differentiation of a new individual even before the egg is deposited by the queen.

Bees need young vigorous queens capable of elevated egg laying and minimum daily pheromone output for colony success. Beekeepers need additional queens to....

- Requeen colonies with failing queens
- Create additional colonies
- Improve stock
- Replace queens with poor beekeeping qualities (such as excessively defensive, poor producers, disease/mite prone workers and other reasons, some unique to individual beekeepers).

Three critical essentials, whether we are raising 1 or 1 million queens, are:

•Rearing – As a larva the developing new queen must receive large amounts of quantity/quality feed

• Selection – the bees, and especially the beekeeper, should rear new queens ONLY within colonies with desirable traits and under optimum rearing conditions

• Mating – Virgin queens should have an ample opportunity to mate with able-bodied drones from other colonies than her own that likewise are offspring of queens heading colonies with desirable traits

Queen Rearing 101

We rear queens the same way the bees do it BUT we strive to make the process more amenable to our schedule and convenience. As with everything else in beekeeping --Timing is everything. When rearing queens we have to ensure that we have queenless colonies and optimal larval rearing conditions for best results. We select the stock and select the larvae [sometimes eggs] that the workers will focus upon to rear queen cells leading to a virgin and eventually newly mated queen.

The two processes by which bees rear queens are termed supersedure and swarming – they differ little initially but the outcome is, as we are well aware, quite different. Bees begin queen rearing when the queen lays a few or several fertilized eggs individually into queen cups. She does so in response to stimuli – she is not making a decision or choice in such behavior. We can adopt either of these two "natural" queen rearing methods to rear our own queens, but neither are very efficient for most beekeepers.

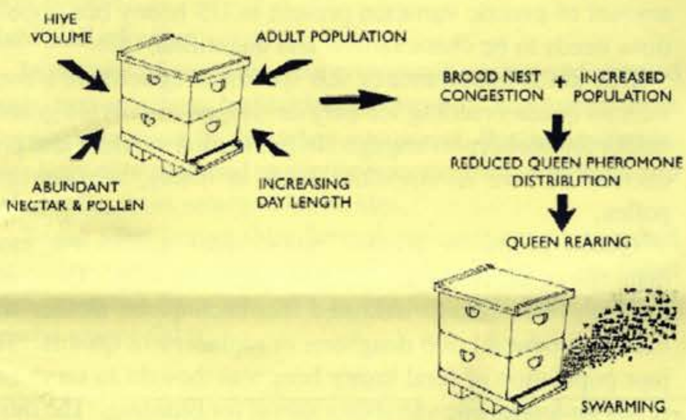
SUPERSEDURE

In Supersedure, a bee colony replaces a damaged or weakened queen by rearing a few new queens, usually started from cups on the comb face and usually during the summer months when we are not in brood chambers of our hives. Thus we are unaware of a colonies queen rearing activities. We can induce colonies to supersede by injuring the queen. Advantages of our using this method is that good queens are generally produced and we can induce selected colonies, thereby obtaining queen cells from our best stock. The major disadvantage is that colonies are large in summer making it difficult to find queens to injure them (or find colonies superseding naturally), few capped cells are usually produced, and it is tough beekeeping dealing with such large colonies.

(Continued from page 4)

SWARMING

In Swarming, colonies begin queen rearing during spring buildup in response to a mix of factors related to queen pheromone production, congestion in the brood area, size of domicile and seasonal factors of resources and increasing day length (see diagram). Such stimuli result in the queen changing normal egg laying behaviors to seek several, sometimes 2 dozen or more, empty queen cups, the majority at comb margins, into which she subsequently lays a fertilized egg. Abortion of queen cells once started is common but if stimuli do not change, the eggs hatch into larva which are then cared for as developing queens. Early in the process worker and queen behaviors change into swarming preparatory behaviors and the process begun by the queen herself culminates in colony division with release of the swarm.



Swarming is the process of the old mated queen leaving the parent colony with 1/3rd to 2/3rds of her daughters. The swarm clusters in a temporary bivouac location while scout bees find and report a new cavity for adoption. When new quarters have been located and inspected, the scouts communicate to the swarm cluster and all leave enmass to swarm into the new quarters. Some colonies release one or more afterswarms, with one or more virgin daughter queens. In the parent colony one (or more) virgin queens hatch in a day or so and one dispatches rivals via stinging and tearing holes in developing rival cells; sometimes she must fight a sister to gain sole possession of the original colony.

Beekeeper induction of swarming is possible but we recognize very poorly the interplay of factors in normal swarming behavior to try to force initiation of swarming. We can wait for the bees to begin the process but then they are managing us rather than the hoped for reverse. When we do have the opportunity to use swarm queen cells, we generally get good queens and the cells are available to requeen when we most often need to requeen. The disadvantages are several: swarming is seasonal during the spring when we are busiest with normal colony stewardship, it is difficult to cut and isolate capped swarm cells and ultimately we are, in fact, selecting for an undesirable bee trait, swarming, by using such cells as a regular requeening method.

EMERGENCY

Thus beekeeper requeening is usually an application of emergency queen rearing. If we dequeen a colony, it will, in a matter of hours, initiate rearing of several replacement queens by modifying worker cells into vertically hanging queen cells which, due to their positional stimulation, are developed into queens before worker ovary development proceeds to halt such behavior. It is relatively easy to induce [admittedly finding the old queen and dispatching her is never 'simple'] and colonies often begin a large number of queen cells. A disadvantage is that queen cells are all extended from the face of worker comb, making them sometimes difficult to remove and isolate. The major disadvantage of queen rearing by bee emergency behavior however is a critical one – the workers will select cells over as much as nine days to rear into a queen and several selections will include older larvae. Queens resulting from cells started with older larvae will yield inferior queens with fewer ovarioles.

Thus normally when we wish to raise queens we modify the colonies methods of emergency rearing by our doing the selecting and positioning of desired larvae [or eggs] for the bees to do our bidding. Steps in producing quality queens are:

Beekeeper selection

- Begin with ONLY selected stock for quality results
- Place an empty brood comb in the selected colony and entice/force the queen to use it for normal egg laying of fertilized eggs

Induction

- Selected day-old larvae is introduced to queenless colony
- 2 days after introduction cull oldest developing cells [omitted if assured oldest queen cells were indeed started from larvae NO OLDER than 1-day of age]
- Separate capped queens cells BEFORE first virgin emerges [some like to practice culling of unusually large or smallish queen cells or those with unusual shape at this time]
- Handle capped cells gently without jarring [generally only within 1-2 days of emergence] and put individually into small nuclei for mating
- Select only those queens that seem to be top quality to requeen colonies.

Understanding queen behavior and how colonies rear queens can help us become better at replacing queens and lead to more profitable and enjoyable bee colony stewardship.

Populations in the US: Comparative analysis of commercial breeding populations through time

Debbie Delaney, WSU

The genus Apis contains close to a dozen recognized species, with all but one endemic to India, for example southern Asia. The exceptional "western" honey bee, Apis mellifera L., has an original distribution allopatric to the rest of the genus Apis that includes Africa, Europe and Central and Western Asia. Within this expansive range, 26 subspecies of A. mellifera have been recognized, based on multivariate analysis of morphology (Ruttner, 1988; Sheppard et al. 1997; Sheppard and Meixner, 2003). Although intraspecific classification of A. mellifera is based on morphology, substantial differences in behavior and physiology occur among various subspecies associated with their adaptation to divergent climatic and ecological conditions.

Humans have been instrumental in increasing the range of the honey bee. At present, Apis mellifera is commonly used in agriculture in all inhabited continents of the world. Pollination by Apis mellifera is crucial to current U.S. agriculture. One third of our total diet is dependent upon plants that are pollinated primarily by honey bees (S.E. McGregor, 1976). The commercial value of pollination in the United States is estimated at 14.6 billion dollars (Morse and Calderone, 2000).

The history of honey bee importations into the United States began in the early 17th century. Historical records show that the honey bee of Western Europe (subspecies Apis mellifera mellifera) was present in eastern North America by 1622, where it established a feral population (Sheppard, 1989). This population expanded in advance of European human settlers, such that Native Americans considered the local presence of honey bees to foretell the impending arrival of European settlers and called the honey bee "white man's flies", (Jefferson, 1788). No additional introductions of honey bees are known to have been made until 1859 (Sheppard, 1989). However, between 1859 and 1922, seven additional subspecies from Europe, Africa and western Asia were introduced into the United States, with varying measures of commercial success (Sheppard, 1989; Schiff and Sheppard, 1993). Of the eight subspecies brought into the country, only three found favor with the beekeeping community and remain available today as selected "strains" from bee breeders. These subspecies (and the commercial designations under which their presumptive descendents are commonly sold) included: Apis mellifera ligustica, (Italians), Apis mellifera carnica (Carniolans) and Apis mellifera caucasica (Caucasians).

Genetic variation is the raw material which enables an organism to adapt within a changing environment. Variation is the prerequisite for selection, both artificial and natural. Due to the introduction of small founder populations during the settlement of the US, the decimation of US populations by Varroa destructor and current queen breeding practices, the amount of genetic variation present in US honey bee populations needs to be characterized and quantified.

Due to the importance of this species to agriculture a commercial queen breeding industry developed to provide genetic stocks for beekeepers engaged in pollination services and production of hive commodities such as honey, beeswax and pollen.

Queen producers provide replacement queens for more than 1/3 of all managed U.S. colonies annually. Estimates from previous studies indicated that each queen mother was used to produce 1,500 daughters or replacement queens. The past population of feral honey bees was thought to serve as a reservoir for genetic variability useful for breeding. The introduction of a parasitic brood mite, Varroa destructor, in 1987 decimated both the feral and commercial U.S. honey bee populations. Past studies using allozymes and mitochondrial DNA analysis reported measurable genetic differences between the two main queen breeding regions in the U.S. However, these studies were performed before major losses of bee populations occurred due to the Varroa mite. Previous studies also suggested that commercial populations were more homogeneous than the feral population. The commercial queen breeding stock was resampled. and the current genetic composition of U.S. honey bee populations is being assessed These results will be compared to the composition of a sample set collected in 1993-1994. Mitochondrial and nuclear DNA analysis are being used to test hypotheses related to changes in genetic variability in the U.S. commercial queen breeding populations over the past decade. Microsatellite analysis is being used to assess whether commercial strains of honey bees in the U.S. retain measurable genetic affinities to their progenitor subspecies. Quantifying the genetic variability of the U.S. queen producing populations will allow us to understand the genetic heritage of the commercial strains of honey bees and to rationally address the complex issue of the need for additional germplasm importation.

Power lines may provide a haven for bees

By Duncan Graham-Rowe, August 2005 NewScientist.com news service

Overhead power lines may be reviled by most people but for the humble bee they may be a saviour. The millions of acres of land-strips beneath power lines represent an untapped conservation resource for bees and other threatened creatures, new research suggests.

Normally regarded as blots on the landscape and accused by many of producing cancer-inducing low frequency electromagnetic fields, high voltage power lines are not typical candidates for conservation sites, says Kimberly Russell an invertebrate zoologist at the American Museum of Natural History in New York. But she says changes in management practice of this land appear to be offering a much needed home for bees, which have been in decline in many countries for decades.

In the US, the land covered by power lines makes up more than 5 million acres. That is more land than almost every national park in the US individually, including Yellowstone, says Russell.

Safe and selective

In the past, these areas were periodically mown and sprayed with non-selective herbicides to prevent vegetation from encroaching upon or damaging equipment. But some companies have now switched to simply removing tall vegetation and using safer, more selective herbicides.

To see what impact this alternate management practice had on native bee populations Russell and colleagues compared bees collected from unmown power line sites with those of nearby grassy fields.

"The statistics showed that the bees collected in the power line scrubs were more diverse than those in the grassy fields," says Russell, who carried out the work with colleagues at Utah State University and Patuxent Wildlife Research Center, in Maryland.

The power line scrubs tended to have rarer species and more bee-parasite species, which is normally an indication of a healthy bee community, she says.

Creating a PR buzz

With more than 20,000 different species, bees alone represent a substantial component of global biodiversity. Next to the wind, they are the main transporters of pollen, making them critically important economically for crops, fruit and vegetable production, says Russell.

Yet for years they have been in steady decline, with the number of colonies in the US dropping by 57% between 1985 and 1997. "This is especially the case in areas that are heavily developed or dominated by agricultural," she says.

If all power companies can be persuaded to adopt the same management strategies it might just be the life line bees need.

So far companies have been happy to help. "They have a huge PR problem because everybody hates power lines," says Russell.

This research might make people start to think about them a little differently.

Journal reference: Biological Conservation (DOI:10.1016/j.biocon.2005.01.022)

California Dreamin': Almond Pollination 2005 and the World of the Future

Eric C. Mussen, Extension Apiculturist, University of California, Davis

California has the largest commercial beekeeping industry of any state in the U.S. (about 500,000 colonies). California beekeepers produce half the nation's queens, nucs and packages; is always in the top four honey producing states; and provides nearly 75% of the nation's reported paid crop pollination. Among some of the crops pollinated are: alfalfa, almonds, apples, avocados, berries cherries, clover, kiwi, melons, pears, plums, prunes, pumpkins, squash, sunflowers, vegetable seeds and zucchini.

California beekeepers can provide enough colonies to pollinate every crop except almonds. In 2005, there were 550,000 acres of almonds in bloom. At two colonies per acre, the growers required 1.1 million colonies of honey bees. Colonies were shipped into California from states all over the country and many packages were imported from Australia. In 2010, it is estimated that 750,000 acres will be in bloom, requiring 1.5 million colonies of honey bees. That number is more than half the total number of commercial colonies reportedly kept in the U.S.

Beekeepers and growers both wish to have the largest colony populations possible in the beehives. Generally, more bees means more brood (larvae); more brood means greater pollen demand; greater pollen demand means more pollination. In order to have significant adult bee populations in February, either the colonies have to have heavy brood production in the previous August and September ("winter bees") or heavy brood production in January ("summer bees"). Substantial brood rearing in January is only possible in limited areas of southern states, particularly around San Diego in California. And, whether reared early or late in the year, healthy populations of bees will be produced only when the bees do not have diseases or parasites.

In an attempt to meet the grower desired "eight frames of bees" in February, many California beekeepers feed their colonies during fall and winter. One normal component of bee feed is sugar syrup. Most beekeepers use commercially prepared and blended syrups and do not spend a lot of time trying to get sugar mixed into water. The other component of bee feed is a protein source to substitute for pollens. The substance that most closely mimics the proteins, vitamins, fats, etc. of pollens, and is affordable, is dried brewers yeast. The brewers yeast, and often some one or more additional protein sources, is mixed with an invert (has fructose in it) sugar syrup to keep the patties moist and pliable.

Western beekeepers are migratory by necessity. The circuit often includes: winter yards; almonds; other pollination; honey locations; fall buildup locations; and back to winter yards. There are very few places in California where commercial numbers of honey bee colonies can be kept year 'round on a single location. The summers are prolonged periods of no rainfall and the irrigated agricultural areas are dangerous due to insecticide use.

Since California beekeepers have to move their colonies quite often, they learned long ago NOT to drive extensive hours moving bees. Tired drivers tend to make mistakes in colony placement and sometimes are involved in vehicular accidents. California beekeepers also are aware that moving bees costs money: truck, fuel, labor, motel, food.

Depending upon the beekeeper, their colonies start arriving in holding yards from northern states in October. There are two types of wintering locations: 1. the Central Valley, with its cool, foggy weather with rain or 2. the foothill locations with warmer, fairly clear weather except when it rains. Although the second alternative seems nicer for the bees and beekeepers, the bees tend to fly a lot and use up all their stored honey and pollens in the foothills.

Most of the colonies from warmer locations arrive in California between November and January. Since growers of various deciduous fruits and nuts often apply "dormant" or "delayed-dormant" sprays of bee-toxic insecticides on their trees, it is a good idea not to drop the bees off in the orchards too early. If the beekeeper registers the apiary locations with the county agricultural commissioner and requests notification, he or she will be notified if a bee-toxic chemical is going to be applied within a mile of the apiary(ies).

Drivers of bee trucks often arrive at their destinations at nighttime. It is appealing to drop the bees in large open spaces, but those often are close to schools, playgrounds, parks, old folks' homes, etc. They are not appropriate locations. Orchards can be rain-drenched and extremely muddy, making it difficult to distribute the bees in small groups throughout the orchard as most growers desire. During almond bloom, if the weather is poor, the beekeepers have to enter the orchards and feed the bees. Eventually, the bees will "get going" on almond bloom and really build up in warm weather. Nearly all the nectar and pollen collected by the bees is converted directly to brood. Because almond nectar is so bitter, there is no begrudging the bees the meager honey crop. Growers hope that the bees will be in place from the first open blossom to the drop of the last petal. This timing can conflict with other pest control practices in the area. There are the previously mentioned dormant sprays, and right at the tail end of almond bloom come the sprays for Egyptian alfalfa weevils and grape cutworms (Penncap M). Also, bees kept in the orchard through the end of bloom may be in there when the grower decides an irrigation is necessary. If the ditches get "pulled" before the beekeeper can get the bees out, it causes a tense communication. After pollination finishes, there are twice as many colonies as normal in California, with not many places to go. They can go back to the holding yards or they can "share" in the sage and citrus honey production areas with the local beekeepers.

Beekeepers who wish to pollinate almonds in California should have a contract signed before moving into the orchard. But most beekeepers do not accomplish that. A beekeeper-grower direct contact is the best. A beekeeper working through a reputable pollination broker is next best. A beekeeper supplying bees to a second beekeeper for placement is third best. And it is a very poor idea simply to arrive in California unconnected and unfamiliar with the territory. The Almond Board of California maintains a Web site (almondboard.com) that includes a Pollination Directory (under "Industry Resources - Pollination"). The directory includes beekeepers, growers, and others connected to the almond production business. You can find contacts or become listed there for free.

Pollination prices are linked, stringently, to supply and demand. The prices that California beekeepers receive for most crops are way below the national average (too many colonies). However, prices that almond growers pay are among the best in the country. In 2004, almond pollination prices varied from $40 (northern central valley) to $55 (southern central valley). A year later, when bees were in short supply, the prices increased to $60 in the north and $85 in the south. Growers without contacts, or with contacts with beekeepers who could not supply their bees, paid as much as $100 per colony for colonies of various qualities. Four pound packages from Australia were installed in hives and used directly for pollination. There are a number of articles on this years' almond pollination experiences in issues of the American Bee Journal. It appears that next season (2006) the price per colony for almonds will be at or above $100.

In the World of Tomorrow, we will need more and more colonies of honey bees to pollinate ever increasing acreages of almonds. Eventually, one third of those bees will come from California, a third from the rest of the U.S., and a third from outside the country (Australia ? New Zealand ? Canada ? Mexico? South or Central America ?).

Washington - Oregon State Beekeepers Conference

October 26 – 29, 2005

Notes by James C Bach

With the introduction of Small Hive Beetles (SHB) into Washington by a Yakima and Vancouver beekeeper it seems prudent to publish information on the experience of the eastern states.

Dr. Mike Hood, Professor Clemson Univ. of S. Carolina:

Small Hive Beetles propagate better in moist soils. The soil type (clay, loam etc.) doesn't matter. Put honey bee colonies in the sun and away from moist soils.

Move colonies often. Migratory beekeepers don't have much of a problem with SHB.

Remove colonies that are heavily infested with SHB from an apiary. Adult SHB will move to other hives for food resources.

To kill SHB, freeze colonies/hives for 2 days at 0^0F. Use Gardstar as a soil application for at least two feet around each hive. It remains effective for about 30 days in soil. Coumaphos stapled to the corrugated side of faced cardboard placed on the bottom board is effective in killing the SHB.

The "West beetle trap" has been developed for use under the bottom brood nest. It consists of a tray that is filled half full with vegetable oil with a screen grid above it.

SHB have 4-5 generations per year.

Do not use push in queen cages in infested hives.

SHB are attracted to division board feeders and pollen supplement patties.

Keep humidity in honey houses at or below 50%. Lack of humidity desiccates the SHB in stored honey supers.

Plastic sheeting under and around the hives in an apiary do not work. The beetle larvae crawl long distances to find soil.

SHB larvae exit hives in mass to go into the soil between 8:00 to 9:00 pm.

Dr. Marla Spivak, U of MN: Breeding bees for resistance to diseases and mites:

SMR queens (resistant to Varroa) are not easily introduced to colonies, have low honey production, poor brood viability.

Dr. Eric Mussen, U of CA:

Bee colonies use about 50 lbs of pollen per year.

Tylosin lasts about six months in syrup, 12 months in honey. It is only to be used in powdered sugar formulations and only when AFB is present in a hive. It has been approved by FDA but is not yet being produced for market and the label is not currently available.

George Hansen, Oregon commercial beekeeper:

Purchased 3,000 Australian (Au) bee packages with Danny Weaver of Texas. Australian queens are no better or worse than US queens. A 3 lb package costs $100, a 4 lb pkg. $120 in Modesto CA. (Some Canadian beekeepers have been reported to destroy the Au queens upon arrival and replace them with Hawaiian queens.)

Dr. Lynn Royce, Corvallis OR:

Discussed DNA and RNA viruses in bees. Most honey bee viruses are associated with RNA.

Latent viruses show up when colonies are under stress.

Bacterial viruses are passed in the genes during development, passed around but unseen.

WSBA Business Meeting:

Jerry Tate, re-elected President

Eric Olson, elected Vice President

Linda Carney, re-elected Secretary

Lisa Knox, re-elected Treasurer

Bob Smith, re-elected Area 2 representative

Jim Bach, elected Area 3 representative

Conference sites: 2006 possibly in Bellingham; 2007 in Winthrop WA at Sun Mountain.

WSBA Executive meeting: February 18, 2006, Ellensburg

Dr. Lambert Kanga, FL A&M: Fungal pathogen research:

Hirsutella thomsonii (variant #2094) fungus takes 3 to 10 days to control Varroa in a colony. It germinates between 25 and 32^{0}C (77 to 89.6^{0}F). 93% of Varroa will be affected in 4 days, 98% in 7 days and 100% in 14 days.

In field trials with Metarhizium anisopliae, there is a spike in effectiveness at 7-8 days post treatment and another at plus 7 days (due to Varroa life cycle). In Florida, the fungus shows less control in highly infested colonies. There is more control with Apigard (thymol) than with the fungus.

There is a need to develop a more stable fungus. When shipped from Pennsylvania to Texas and then to the apiary, the fungus dies. We need to develop application use rates and a fungus that lives to the end of the treatment – 25-30 days.

After 5 minutes in the hive, the fungus is found throughout the colony. The fungus from treatments has been found in control hives 75 yards from the treated colonies.

Dr. Marla Spivak, U of MN: Queen issues:

Mark queens with model airplane paint or Tester's Enamel.

50% of drones mating with a queen must be from hygienic colonies for the offspring colony to exhibit hygienic behavior.

She doesn't think that current queen problems are from inbreeding.

Dr. Eric Mussen, U of CA: Formic acid:

Twenty percent of the audience that used formic acid wore approved respirators. Eric cautioned that formic acid goes through the skin and respiratory system to the liver and burns it. The use of formic acid has resulted in the death of some beekeepers.

Dr. Steve Shepard, WSU, Roy Thurber Research Chair:

Varroa thresholds are a natural drop of 14 in 48 hours and less than 10 in 24 hours in the fall.

Clint Walker, Texas commercial beekeeper:

Russian queen stock must be bred each year to maintain Varroa resistant capability. It requires expensive and intensive management to select, breed and maintain the stock trait.

The SMR (Varroa resistant stock) are not good honey producers and have a poor temperment.

George Hansen, OR beekeeper: National Honey Board

Dr. Diana Sammataro, USDA, Tucson AZ: Oxalic aci:

Diana compared her results from the testing of Oxalic acid and Sucrocide. Correct dose and application numbers are yet to be determined. During the discussion Marla Spivak suggested using only a 3.5% acid formulation, once or twice on colonies. Heather Clay of the Canadian Honey Council was reported as having said that oxalic acid treatments kills open brood.

Panel discussion – Drs. Spivak, Mussen, Sammataro:

Items discussed: ApiLife Var, ApiGard, Vegetable or other oils. There is no data to support the claim that oil nebulizers control Varroa.

Queen importation was discussed. Dr. Spivak prefers importation from Europe.

Oxalic acid fumigation of hives changes the oxalic to formic acid and a water molecule. In Europe they prefer to use formic acid on a colony in the summer, then remove and extract surplus honey and if necessary use oxalic acid.

Varroa mites are not controlled by the use of vinegar machines. California beekeepers are selling them cheap.

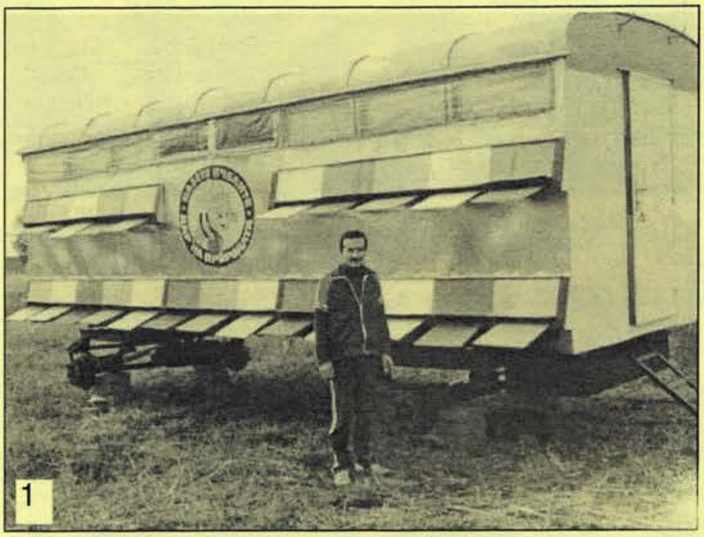
The honey bee genome has been carved into pieces and catalogued but it is not known where in the genome the pieces fit.

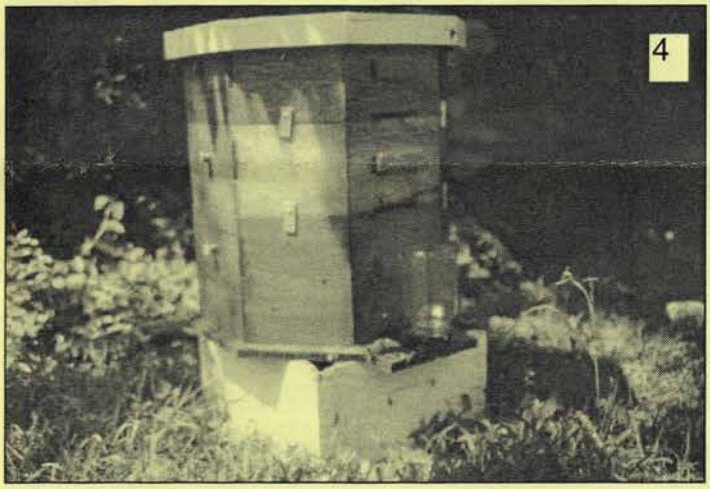
Conference adjourned.

Traveling Beekeepers

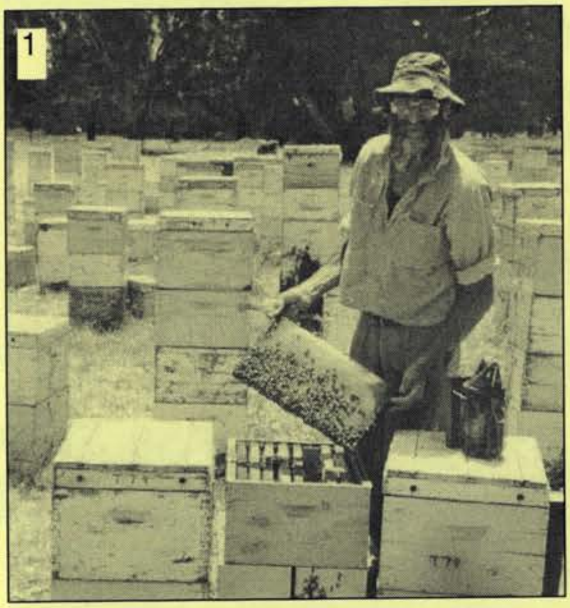
Bert & Jeanette Otto, Yakima WA

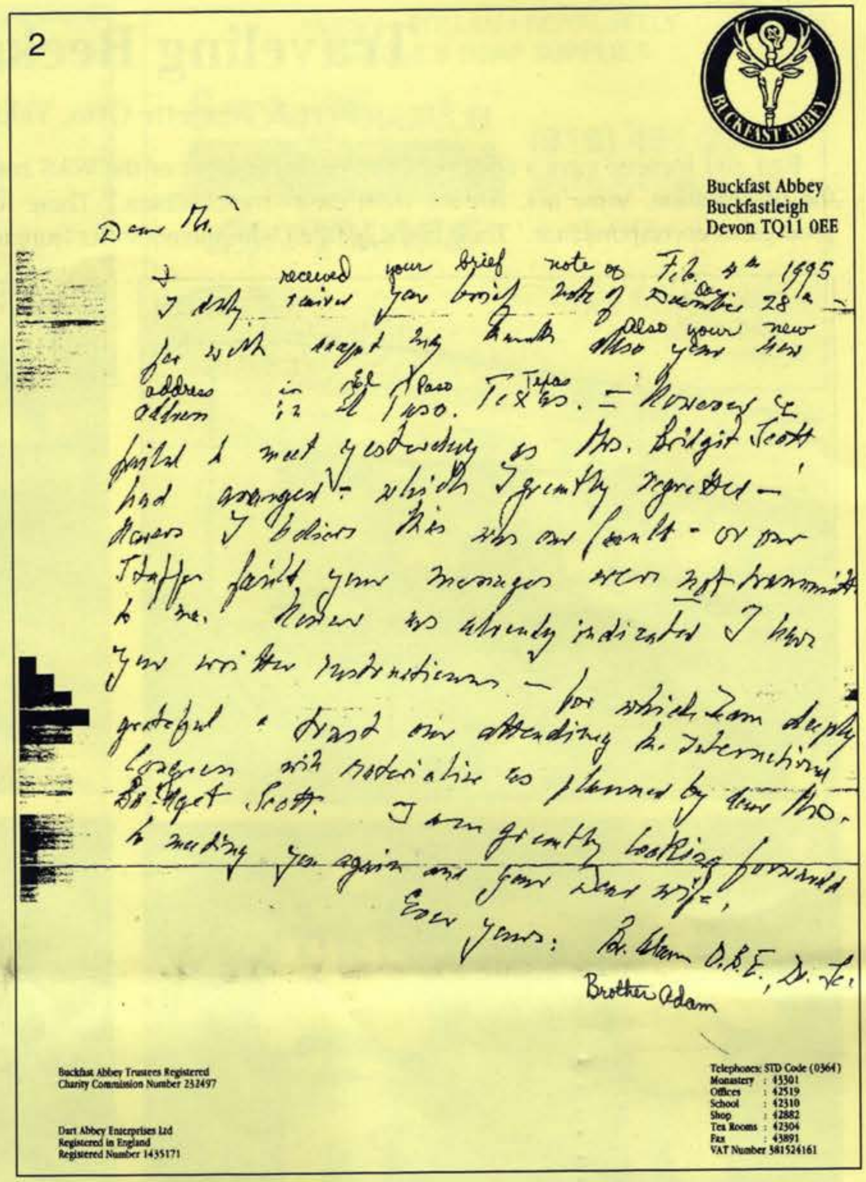
Bert and Jeanette gave a slide presentation at the close of the WAS conference. Some of the following photos were part of the presentation, some not. All are from their "travel album." These folks have truly "been everywhere" and maintain a prodigious correspondence. Their home is filled with memorabilia from all over the world.





1. Bee house belonging to Stoian Ivanov Stoianov in Bulgaria, 1994.
2. Inside of Bulgarian bee house.
3. Bert & an unknown member of the US tour group with a Stewarton hive at Rothamstead Research Centre in England in 1989. This hive type was originally designed by Robert Kerr of Stewarton, Ayrshire, Scotland around 1819.
4. Bert's home-built Stewarton hive.
5. George Robertson of Raleigh, North Carolina, and his Kenya top bar hives. Bert had one built of plexiglass so he could see the bees working inside it.





Buckfast Abbey
Buckfastleigh
Devon TQ11 0EE

Dear Mr.

I duly received your brief note of December 28th — for which accept my thanks. Also your new address in El Paso, Texas. — However I failed to meet yesterday as Mrs. Bridget Scott had arranged — which I greatly regretted — However I believe this was our fault — or our staff's fault, your messages were not transmitted to me. However as already indicated I have your written instructions — for which I am deeply grateful — trust our attending the International Congress will materialise as planned by dear Mrs. Bridget Scott. I am greatly looking forward to meeting you again and your dear wife.

Ever yours: Br. Adam O.B.E., D.Sc.

Brother Adam

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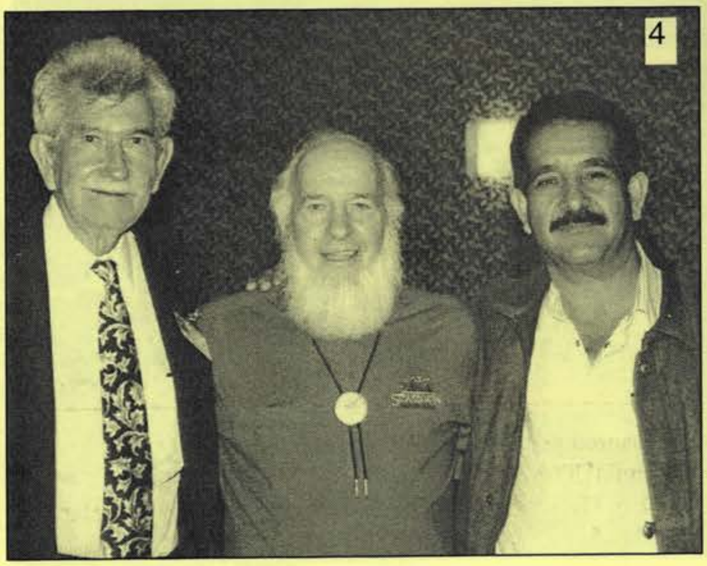
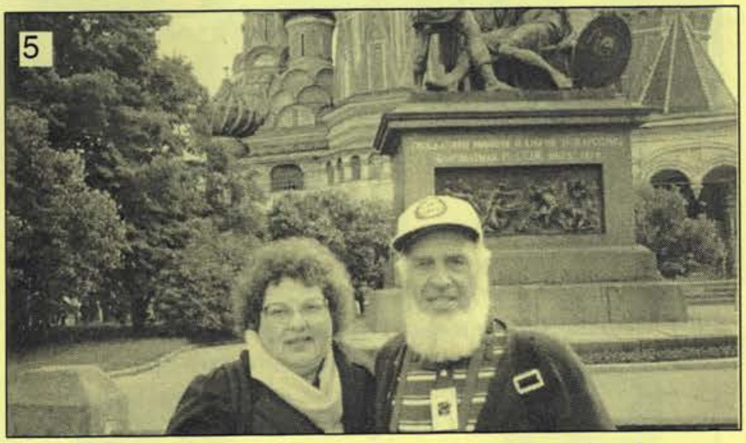
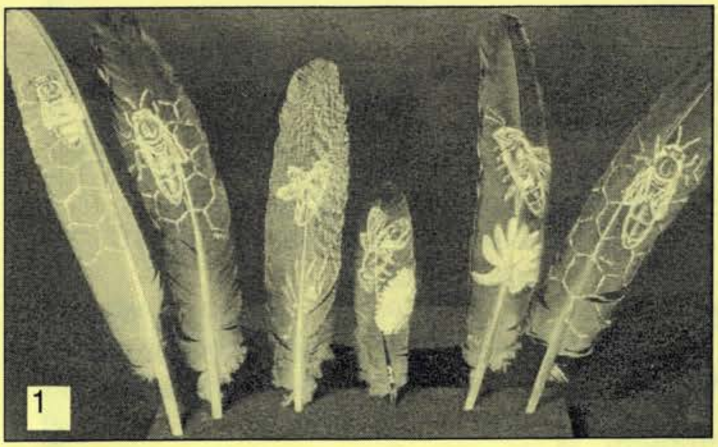




1. In Chiltern, Australia, 1988, with Alex Taylor. 2. A letter from Brother Adam, 1995. 3. Polish couple in national costume at Apimondia in Lausanne, Switzerland 1995. 4. Bert (centre) with beekeepers Enrique Ochoa-Cunningham and Daniel (surname unknown) in Cd. Juarez, Chih, Mexico. 5. Bert & Jeanette in Moscow 1994.



1. Painting on turkey feathers by Marjorie Watkins, Troy, Kansas -- a treasured possession. 2. Bert removes bees from a house in Port-au-Prince, Haiti, 1994. 3. Bert & Jeanette arrive at Apimondia 2005 in Dublin, Ireland. 4. A lesson on the ancient Irish bodhran -- Bert on left, Sara Willis (CA) on the right. 5. & 6. Honey and wax displays at Apimondia in Ireland. #6 is first place winner by Virginia Wells of the US.

Beekeepers' Calendar

NOV. 19 - 21: CHINA INTERNATIONAL APICULTURAL CONFERENCE & BEE PRODUCTS EXHIBITION, Beijing, China. Info www.chinabee.org.cn or Chine-apiculture@263.net

JAN. 10 - 14, 2006: AMERICAN HONEY PRODUCERS ASSOCIATION ANNUAL CONVENTION, Hilton Houston, Houston Texas. Info Jerry Brown 785-778-200, brownhoneyfarms @hotmail.com

JAN. 11 - 14: AMERICAN BEEKEEPING FEDERATION 63RD ANNUAL CONVENTION & TRADE SHOW, Hyatt Regency Hotel, Louisville Kentucky. Info ABF, 912-427-4233, info@ABFnet.org

JAN. 24 - 28: CANADIAN HONEY COUNCIL ANNUAL MEETING, Palace Royal Hotel, Quebec City, Quebec. Info Heather Clay 403-208-7141, chc-ccm @ honeycouncil.ca

FEB. 9: ALBERTA INTEGRATED PEST MANAGEMENT WORKSHOP, Executive Royal Inn, Edmonton, Alberta. Info ABA 780-489-6949, Gertie.Adair@AlbertaBeekeepers.org

FEB. 10 - 11: INTERNATIONAL MEAD FEST, Boulder Outlook Hotel & Suites. Boulder, Colorado. Info: info@meadfest.com

MAR. 20 - 24: 8TH ASIAN-AUSTRALIAN APICULTURE CONFERENCE, University Club of WA. Stirling Hwy, Crawlwy, Perth, Western Australia. Info (+61 8) 9386-3282 or honeybee@debretts.com.au

JULY 24 - 27: WESTERN API-CULTURAL SOCIETY ANNUAL CONFERENCE AND AGM, Buellton California. Info Dr. Adrian Wenner 805-963-8508 .

JULY 31 - AUG. 4: EASTERN API-CULTURAL SOCIETY CONFERENCE, Young Harris College, Georgia. Info 518. 963.7593, secretary@easternapiculture.org

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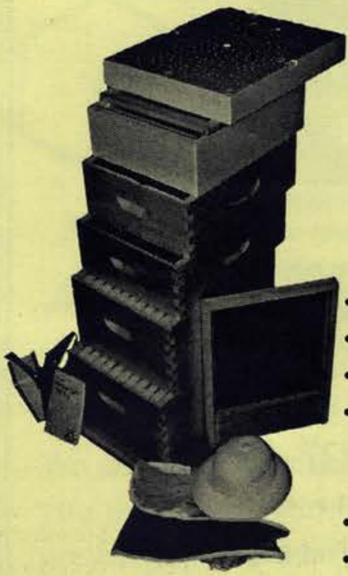
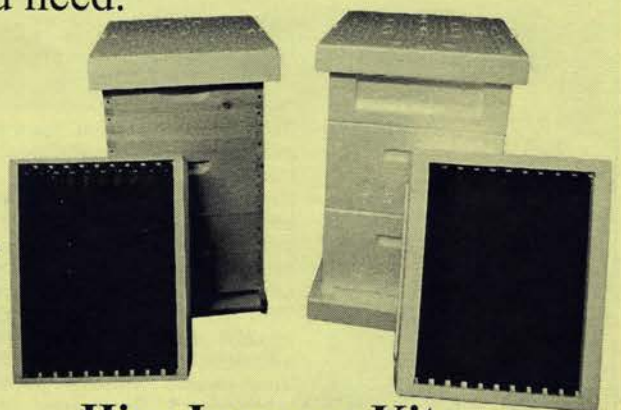
CLASSIFIED....

Christmas is coming! A special gift for someone special.... 1 honeybee pin and 1 honeybee pin/necklace, of authentic Black Hills gold (10KT) from South Dakota (about the size of a dime). Was $90 each but now just $68 each, plus $5 shipping & handling. Money orders only please...or purchase at the Northwest Beekeepers Conference in Newport OR October 27 - 29 with cash and no S&H. Bert & Jeanette Otto 509-249-2902, PO Box 9552, Yakima WA 98909.





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