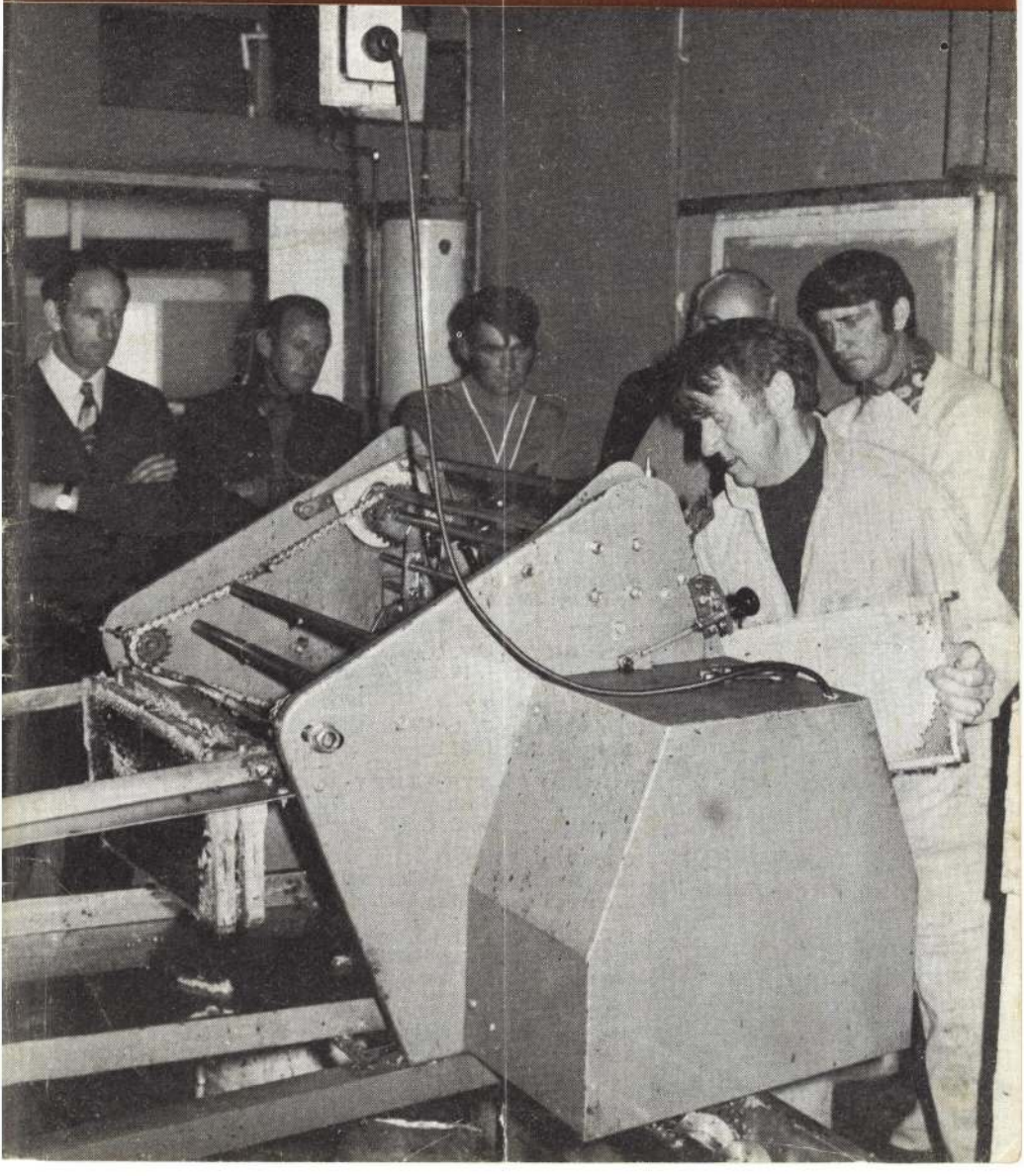
THE NEW ZEALAND BEEKEEPER

May 1973



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Editor: Norman S. Stanton **MAY, 1973**

CONTENTS

OBJECTIVES

My audience is greatly increased this month; some comment will therefore be pertinent. *The New Zealand Beekeeper* is my only contact with beekeeping; I have no apiary in which to commune with *apis mellifera* nor can I reap the rewards of this rapport by spreading my morning toast thick with delicious comb honey. But I have learned to respect the average beekeeper, rugged individual that he is.

He may well need to be both physically and financially rugged to stomach some recent developments in this industry which are so remote from developments in the home apiary. He has direct control over many apiary problems but can be forgiven for his feeling of isolation from solutions to problems in the industry.

However, I still firmly believe there is a remedy and it is worth working for. This remedy will not be found in the isolation of resignation from the National organisation because we do not agree with some decision passed by a majority at the last executive meeting. As I see it, we are over-supplied with

'drones' who make a lot of noise complaining and finding fault with everything in the industry; but we have not enough 'workers' whose principal interest is the welfare of the hive (industry) as a whole. What so many fail to see is that a healthy prosperous industry as a whole must ultimately result in benefits accruing to the individual. Setbacks like the present 20c payout are only temporary; in time reason will prevail.

The interest of the industry as a whole can best be served by a strong National organisation which has a 100% membership who individually and collectively take their responsibility to the industry seriously.

There are ample opportunities for discussion and dissent. Letters will be printed without comment from all and sundry; but on a vote, the majority must prevail. And those who are in opposition to the majority should, like opposition Members of Parliament, remain loyal to the industry.

The first and best move towards this objective is for you each to reach now for your cheque book and send off your subscription to the National Beekeepers Association Inc. as well as to this journal at the reduced rate which now applies. On their part, I am confident that the present executive and any future duly elected executive will do their best for the industry without prejudice. And it goes without repeating that I am here to do all within my power to keep you all informed through this magazine.

All too often someone who has a large hive holding rushes to the newspapers, the radio or television, or goes off to Wellington to see this Minister or that, or writes to this same Minister as though he was expressing opinions which represent the views of the industry as a whole. When one is acting alone and without consulting anyone it is usually easy to get something on paper or into print or into someone in authority's ear because there is no need for time-consuming consultation or discussion. Trouble is that the Press or the Ministers of the Crown hear this voice as though it represents the industry as a whole and it is then doubly hard for those who have the backing of the industry to convince the same people that they have been wrongly informed.

The case quoted below bears a close resemblance to the hypotheses outlined above. Whether or not it had an influence on the powers that decide maximum payouts to producers of honey or not is for our readers to decide. Clearly the public have been brainwashed by propaganda which does not give a truly objective picture of honey prices and beekeepers incomes.

The press report (right) was published in most morning papers throughout the country covering possibly half the homes in the country but Mr Bailey's unsolicited reply will be see by only about ¼ of the 3,200 registered beekeepers in the country. Is this fair?

Press Assn Timaru

Honey would soon become a luxury item on the household budget if the bulk payout to producers rose to 25c a pound, according to Mr R. Davidson, of Davidsons Apiaries Ltd., near Timaru.

Mr Davidson, whose company produces honey as well as packing it, said that even the 20c maximum price to beekeepers now required by the Government would sharply increase the present retail price.

"The 25c a pound wanted by the Honey Marketing Authority would place honey in the luxury class at 50c a lb. and most packers for the local market would find sales difficult," he said.

Referring to a suggestion by the Opposition agriculture spokesman, the Hon. D. J. Carter, that the Government should subsidise the price of honey for the local market, he said the industry was already getting a yearly boost from a $500,000 overdraft with the Reserve Bank at 1% to keep it functioning.

"It also gets a yearly gift by way of levy (1¼c a pound on the shelf), of about $25,000 from the general public," he said.

Commenting on a statement by the MP for South Canterbury, Mr L. G. Talbot, that "the situation is intolerable as far as beekeepers are concerned," Mr Davidson said that in actual fact they had never had it better.

"The bulk price of Canterbury honey has risen from 14½c in 1971, 18½c in 1972 to the suggested 20c price of 1973," he said.

"Will the advocates for fancy prices on the New Zealand market be as keen to reduce prices when good crops overseas cause problems?"

Mr Davidson said Canterbury beekeepers had experienced seven poor seasons and this was the reason for the poor returns.

He said Canterbury beekeepers should move elsewhere if they could not run on the "half-crops" which were all that were available in the province.

He said it would be better to increase the local honey prices slowly.

Hiway Gardens,
No. 4 RD,
TIMARU
28th April 1973

Sir,

Mr Davidson had a letter published in the **Timaru Herald** in which he said the Beekeepers of N.Z. are better off than ever before. I understand this was forwarded by the Press Association to every newspaper in the country. (Our copy below appeared in the **N.Z. Herald**, Auckland. — Ed.).

I was a beekeeper for 15 years until last year when, after a long period of poor seasons and poor prices I sold out and bought another business. Now I am a producer of another primary product which gives me a much better financial return for my labour with less capital invested and shorter working hours.

Mr Davidson bought my first season's honey crop for 1s 1d per pound. In 1970 I was paid 12 cents per pound, just one cent increase after 13 years. I understand Mr Davidson was paying a similar price at this time also.

Anyone can see that beekeeping has become totally uneconomic during this time through increased costs. Most beekeepers I knew were finding the going tough and there was a lot of unrest in the industry.

Even when honey prices rose to 18½ cents last season this still did not allow me to make a fair return for the long hours of heavy work, plenty of bee stings and the uncertainty of not knowing if I would get a honey crop or not.

I just cannot understand how Mr Davidson can say the beekeeper is better off than he ever was. Even 25 cents would not cover the increased costs and give a fair return. Is this only concern his packing business? Of course a packer wants to buy his honey as cheaply as possible. This may be good business for him but it's not good for the honey producer.

I would not go back to beekeeping for a price of 35 cents per pound, let alone 25 cents. I am far better off now than I ever was while I was beekeeping and I am sure a lot of beekeepers would be better off working for wages than trying to make a living at producing honey at 20 cents a pound. — B. G. BAILEY.

Executive Sub-Committees

The time has come for our industry to be fully united with but one voice which speaks on matters of national importance. And the time to deal with this long overdue matter is now.

For too long small groups representing sectional interests have tried to operate outside the National body without being fully informed about or having the interests of the industry as a whole at heart. The result has been some confusion and in at least one recent case has led to the possible loss of hundreds of thousands of dollars to the industry as a whole.

To explain and launch this new concept meetings will be called in Nelson in July. These will be held at suitable times so that there is no interference with the business of the Conference. Malcolm Haines will convene the Queen Breeders Section and Ernie Whally the Honey Packers Section.

These meetings will elect their own independent chairman. When problems have been fully discussed and decisions reached the N.B.A. Executive will be advised through their liaison convener. This will lead to more fully informed decisions being made at National level. As long as any recommendataion is in the national interest, it will have complete N.B.A. backing.

This system has so much to recommend it that you, as a beekeeper, cannot afford to let it fail. Don't be dissuaded by the pessimists who say it won't work. It can and it will if YOU want it to!.

NEWS FROM LEADING BEEKEEPING

THE IRISH BEEKEEPER

THE IRISH BEEKEEPER—Monthly magazine of the Federation of Irish Beekeeping Associations. Secretary/Treasurer/Manager, Mr John A. Aherne, Mon Chalet, Boston Park, Cork, Irish Republic. Subscription 12½p posted.

U.K. Honey Shortage—Warning

Britain faces a honey shortage because too many breeders have neglected British bees in favour of weaker foreign strains, the British Isles Bee Breeders' Association said recently.

The Association estimated that honey yields might be as much as 50% down this year. It blames the bad summer and the effect it has had on imported bees, which, it claims, are unable to withstand the rigours of the British climate as well as native breeds.

In the south of England alone, 85% of honey bees are now from warmer European climates; only breeders in the north of England and Scotland still produce the bulk of their honey from British bees.

The Association is urging more people to concentrate on preserving the British bee, which is hardy enough to produce top-quality honey during cycles of colder weather.

The Association's director, Mr Beowulf Cooper, a research officer with the Ministry of Agriculture based in Derbyshire, said radical changes must be made if honey production is not to suffer further.

"Britain can never produce enough honey for herself and has to import," he said, "but there could be a big improvement in home production if more commercial companies moved in to exploit vast, unharvested honey supplies on the moorlands of the north and west of the country."

—Financial Times, 17/10/1972.

Queen Substance

Experiments have shown that the queen produces a substance which the attendant bees lick off her body and pass around to the other bees of tne colony. This substance appears to have a considerable influence on the bees' behaviour. As long as it is in adequate supply, it prevents the workers' rudimentary ovaries from developing. It also inhibits them from building queen cells and appears to keep them contented. Apparently, as the queen gets older, she produces less of this queen substance. Some of the workers, having less of this substance to share around, develop a greater tendency to start building queen cells. This is why colonies headed by old queens are more likely to swarm than colonies with young queens.

If you remove the queen from a hive, there is no immediate reaction from the bees. This action has no more meaning for them than the removal of a worker or a drone. But let a few minutes elapse, and soon there is a general commotion ,with bees running around in all directions and looking most unsettled. This phenomenon, which is more marked in some colonies than in others, is called queenlessness and is presumably caused by the sudden loss of the queen substance.

PUBLICATIONS AROUND THE WORLD

LAYING WORKERS

After a while the bees seem to resume their normal activities but with much less zeal. If there is a honey flow, the amount of honey being produced will be less than for a queenright colony of the same strength. However, since there is no brood to feed, most of the nectar being brought in will be stored although a lot of this will be in cells in the brood next normally reserved for brood rearing.

Deprived of their queen substance, the worker bees will start queen cells. Since there is no queen to lay in the queen cells, these are built around eggs already laid. Such cells, starting from the comb midrib, do not project much from the comb face and are not conspicuous. They are called emergency queen cells.

Bees are hopelessly queenless when, upon losing their queen, there is no young brood from which to rear a new queen. This happens for instance

when a queen on her mating flight fails to return, having been either lost or caught by a bird. In such cases, laying workers may appear after a while. These are ardinary worker bees having ovaries that have become more developed, because of the absence of queen substance, to the point where they can lay eggs. Such eggs, being unfertilised, can only produce drones. There will be not one but a number of laying workers in such a colony. The eggs are laid in a haphazard way in worker cells, so that individual cells containing drone brood appear here and there without any sort of order.

The bees make an attempt at enlarging the worker cells to accommodate the larger drones and to provide them with raised domes capping. The resulting drones are dwarfed and stunted in ccomparison with normal drones.

The only thing to do with such a colony is to invite it to a queenright colony. Strangely enough, once a colony has laying workers, it will not accept an introduced queen and it is a waste of time trying to introduce one. Even if a colony that has long been queenless has no laying workers, it will not be in a fit condition to receive a queen, the reason being that there are no young bees capable of properly feeding royal jelly to the new brood.

THE SCOTTISH BEEKEEPER

THE SCOTTISH BEEKEEPER—Monthly magazine of the Scottish Beekeepers Association. General Secretary, Mr Adam F. F. Maclure, "Braemount", Station Road, Longforgan, Dundee, Scotland. Subscription £1.50 posted.

Bee Stings Helpful — It has been said from earliest times that bee stings were helpful for some forms of rheumatism but now from an Associated Press release in Teheran, Persia, reported in "The American Bee Journal," comes a claim that the bee stings are a cure for several types of eye weaknesses. This claim is made by a Soviet eye doctor, Prof. Vasili Maximenko of the Russian Hospital in Teheran.

"After experiments involving more than 250 patients, Maximenko has used bee stings to cure all eye patients," a spokesman for the hospital said.

Maximenko also claims that honey is the best cure for rheumatism, ulcers and liver problems.

Two patients confirmed in Teheran that their eyesight improved by up to 10% after bee sting treatment.

Maximenko's usual bee sting cure starts with one sting a day on the forehead, increased to four times a day for a total of three months. The patient gradually regains his sight or his eye infections disappear.

It is emphasised that treatment such as this should only be undertaken with strict medical supervision.

A Beneficient Tick

The question is frequently asked: "How can I get old, mildewed pollen out of my combs?" It has been suggested that the combs should be soaked in warm water and whirled in the extractor. That may be effective, but it adds work to the already over-taxed beekeeper. It is also true that the bees themselves can winkle the hard pollen out of the cells, as one may observe in Spring, when it is often found lying in front of the hive. But of course bees should be more profitably employed inside the hive.

If you read "La Belgique Apicole" for October last year, you will find what appears to be the easiest of all methods of getting rid of this useless pollen. No danger, no difficulty. It is the method adopted by a president of a Belgian Association, who is not only a beekeeper but a farmer to trade.

In the loft above his house are kept his sacks of flour. Now and then, to keep his flour in prime condition, as you would with bags of cement, he shake and turns the sacks over. A grey-white dust spreads over and settles around these sacks in the process of their being turned over. The same dust is found in milling sheds and in bake-houses.

This farmer collects the dust and powders it over the frames he wants to clean. When they have thus sat all winter, he only has to give the frames a shake and, hey presto! — out falls the pollen, now itself reduced to a powder.

As with some other inventions in this world, the flour-dust discovery was purely a matter of chance. As a young beekeeper the Belgian had been in the habit of storing his frames in his loft not far from some sacks of flour. To his surprise he noticed, come Spring, that the once pollen-filled frames were now full of dust. When he shook them, they became clean. The following winter he experimented purposefully by giving all his frames a shake of the flour-dust. The results proved its effectiveness.

A scientist-researcher of the Apicultural College of Nalinnes supplied the key to the mystery. A tick finds a living in the flour-dust and merits the scientific name of "Acar Farina". This tick also in fact consumes pollen; hence the success of the president-farmer-beekeeper. How the tick happens to be in the flour is not known, but it is an observed fact that it is quite harmless to the bee, and the beekeeper can dispense with the moth-balls to preserve his combs.

Propolis—Fantastic Discovery

Danish beekeepers have recently had the opportunity to increase their earnings. They have been scraping propolis off frames and cover boards of their hives and carefully collecting it. They can get one krone for each gram of pure propolis.

One beekeeper is reported to have earned 3,000 kroner in this way in the season 1972. This use of propolis as a medicine has fairly caught on in Denmark and two well-known drug companies are marketing propolis.

In the Danish Weekly "Dansk Familiablad" No. 42 1972 there is a five-page article devoted to the qualities and use of propolis as a medicine.

The heading of the article describes propolis as 'Nature's Own Medicine'. It goes on to say that domestic propolis will save Denmark millions of kroner on imported drugs. The basis of the article is the story of Mr Karl Lund — a Town Clerk and a beekeeper who claims that he cured his sore throat and high fever by eating propolis.

In the County of Holbeck, at a meeting of beekeepers many of those present were able to give accounts of the successful use of propolis in the treatment of various diseases.

The propolis is sold in granule form or in other forms, depending upon the treatment required. It can be chewed, sucked or simply swallowed.

We are indebted for all this information to Herr Otto Christiansen, formerly General Secretary of the Federation of Danish Beekeeper's Association, and our good friend of many years standing.

Herr Christiansen gave up beekeeping several years ago and went in for tropical fish rearing. We are pleased to welcome him back to beekeeping in his retirement. We have the full text of the article in Danish and will be pleased to lend it to anyone who can translate it.

THE BRITISH BEE JOURNAL

THE BRITISH BEE JOURNAL—A fortnightly magazine published by British Bee Publications Ltd., 46 Queen St., Geddington, Kettering, Northants, England. Subscription, £2.75 per annum posted.

Embarrassing Moments

After all these years in beekeeping I have come to the conclusion that beekeepers are a rotten lot, because when you tell them something to draw sympathy they just laugh at you.

This is how it happened. A few years ago, when the shelter outside Newbury Park Underground was being built, I received a call about a swarm of bees that was hanging in a heap of barbed wire.

It was a Sunday and I had on my Sunday best.

When I arrived at the station one of the workmen showed me where the swarm was, and as no one was about I changed into a pair of old trousers I had brought with me and then made my way into the spot where the bees were, but despite everything I soon tore those trousers in several places.

Before I finally captured the swarm, quite a few people had collected, so I couldn't very well change back to my other trousers in front of a crowd. I headed for the train home, intending to change either in the toilet or in the station waiting-room.

However, as I got to the platform a train was coming in, so I jumped in.

As I was on my own in the compartment I thought to myself: "I'll do a quick change." The old trousers had been so torn about that they were useless. So down with the old and I dumped them out the window. Then I opened the carrier bag to get my other trousers. No trousers!

Then I remembered I had folded them up neatly and put them on the ground while I tackled the bees, only to walk away without them. There I was, sitting in a train in my underpants. You can guess the state I was in.

I got out at the station near to home, walked home instead of taking a bus, got another pair of trousers, and then returned to Newbury Park.

There were my good trousers, ust where I had left them. So, you see, I didn't think there was anything to laugh at.

(We think it is one of the funniest episodes we've read for a long while.—Ed.)

PETER TIGHE

Snippets From Here and There

- The Minister of Agriculture has announced that Farming will not go metric until 1975-76, a year later than planned. The annual review and census will be in metric terms, for the first time, in 1976. Recently available "Going Metric on the farm." A 12-page booklet, free, from Metrication Board, 22 Kingsway, London, WC2B 6LE.
- The average take of flower honey for the British Isles for 1972 has been estimated at between 20 lbs.-24 lbs. per colony. Some beekeepers took nothing but several takes were above 80 lbs.
- According to the Australian Honey Board they exported 8,800 tons of Australian honey during 1971/72 and set a record for export earnings. Honey was shipped to more than 60 countries with Japan taking over 3,000,000 lbs.
- With the revaluation of Australia's dollar the price of honey to Britain has reached even higher levels. Light amber honey was offered at £400 c.i.f. just after Christmas.
- The Spray and Pesticides Committee of the BBKA have prepared a very useful questionnaire for those who might find themselves involved with loss of bees from spraying. It pinpoints the relevant questions required to be answered to get a claim augmented.
- American clover honey is an all-time high of £410 per ton, and in Australia prices continue to climb as Japan and Germany vie with each other for supplies that get less and less.
- The BBKA is looking for an emblem with which to launch its centenary in 1974. If readers would like to try their hand at a simple, clean cut design which could be used as a car sticker, or for publicity, please submit your ideas to the Hon. General Secretary, Mr Owen Meyer, 55 Chipstead Lane, Riverhead, Sevenoaks, Kent.
- David Frimston has drawn our attention to a summary of the 1971 Rating Act: "S.3 post, derates buildings occupied solely in connection with bee-keeping again subject to the condition that they are surrounded etc., by five acres of agricultural land.

  "A building, other than a dwelling, is an agricultural building by virtue of this section if:

  "(a) it is occupied by a person keeping bees and is used solely in connection with the keeping of those bees, and that it is surrounded by five acres of agricultural land." Note, however, it would seem the five acres of land do not have to be the property of, or in the occupation of, the beekeeper.
- So you think you've got problems. This is from a Northern Ontario Government publication: "Bee yards placed any distance from a dwelling or near bush or swamp must be protected from damage by bears. The best way to protect a bee yard is through the use of electric fence, once a bear has had a taste of honey it is impossible to keep him away from the bee yard even with an electric fence. Therefore it is essential that the fence be erected before or at the same time the colonies are set out. Care must be taken to see that the fence has a good ground connection.
- In the Canadian Bees Act, which governs the behaviour of bee-keeping, it says: "No bee-keeper shall keep bees in a hive without moveable frames." There is no regulaation of this kind in Great Britain.

- The same Act forbids in rural areas the keeping of bees closer than 30 feet from the nearest highway dwelling, or cultivated field, unless protected by a hedge or fence at least seven feet high and extending at least 15 feet beyond the bees at both ends. For urban areas bees must not be less than 100 feet from adjoining properties whether dwellings or places used by the public.
- According to the **Daily Telegraph** the production of honey and beeswax in India last year fell by 50 per cent because it is forbidden to hunt the tiger Twenty-nine honey-collectors north of Calcutta were eaten by tigers and this has discouraged others from continuing.
- The central African states, it is reported, are putting more and more effort into honey production. Ethiopia, too, it is rumoured, is likely to emerge as a substantial honey-producing country in the not-too-distant future.
- US Postal Service is planning to expand its facilities to bee-keepers for handling queens and package bees through the post expeditiously. Owing to an indifferent delivery service the postal authorities have lost much of the bee trade, which had been built up over the years.
- While few of the larger export countries have little honey on offer, France has unsold stocks but is reluctant to offer while hoping for higher prices.

GLEANINGS IN BEE CULTURE

The Bee of the Future

Professor F. Ruttner of West Germany, states that the bee of the future should have three characteristics:

1 A high reaction capacity in order to take advantage of new honey flows.
2 The bee must be gentle so that it can be kept in and around cities and villages.
3 It must be adaptable to a wide range of climates, resistant to the usual diseases, and be a good forager.

Additionally, Prof. Ruttner would prefer a bee with a low swarming rate but one in which the colony population increased rapidly. He suggests that of the four primary European races the **carnica** (Carniolan) bee is the best. Prof. Ruttner's experience is limited to Europe but he has tested a great number of races of honeybees over several decades.

In my experience, commercial beekeepers in this country seem to pay far more attention to production than any other factor. Many of them pay little attention to whether or not a bee has a propensity to sting. In fact, there seems to be a belief among commercial beekeepers that bees which sting more produce more honey; so far as I am aware, there are no facts to back up this statement, however.

In his paper, Professor Ruttner notes that our population is increasing and that beekeeping territories are becoming increasingly crowded. This might mean that we will have to pay more attention to the aggressive characteristics of bees in the future.

Reference — Ruttner, F. The bee of tomorrow and its development. Apiacta 7: 97-8. 1972.

The idea that honey production will not necessarily always be the most rewarding aspect of beekeeping is gaining ground. The quotation from "Gleanings in Bee Culture" on Page 11 and the following are examples of recent thinking on the topic

Honey production in the United States during 1972 totalled 214.6 million pounds — up 9% from the 1971 crop, according to the Crop Reporting Board. The 1972 crop was produced by 4.1 million colonies, down 1% from a year earlier. Colony numbers have declined eacch year since 1958. Yield per colony was 52.8 pounds, compared with 48.0 in 1971. California, with 500 thousand colonies, produced 24.5 million pounds, 11% of the nation's production. Florida, with 350 thousand colonies, produced 26.6 million pounds.

Extracted honey in wholesale lots sold for an average price of 28.6 cents per pound in 1972, 9.0 cents above 1971. Prices received for retail sales of extracted honey averaged 43.1 cents per pound in 1972, 6.5 cents above 1971.

WANTED: Bee With a Big Behind; View Travel

By Noel Holmes in "The Auckland Star"

Niue — Wanted: A bee with a big behind. Must be a willing worker and prepared to live in tropics.

Duties: To pollinate Nieuean passionfruit.

The passionfruit pulp industry here is quite promising.

It began only about five years ago when a vine was discovered that enjoyed the soil and the climate.

It is not unlike our New Zealand passionfruit but is rather larger and is yellow when ripe. It's a heavy bearer, unlike the conventional vine which runs rank and produces little fruit.

There's only one catch.

The flowers are huge and ordinary bees are too slender to carry out pollenation.

Further, the vines have to be cross pollinated — that is the pollen from one vine has to go to another. At the moment the job is being done by hand.

You get an artist's brush and a jar and you collect all the pollen from one vine and scatter it around on the flowers of the next. You can't let up in the peak of the season because the flowers are only open for a few hours — they certainly don't live longer than a day.

So mum, dad and all the kids have to set to work and keep at it to ensure a crop.

It's a finicky business but well worth while because the fruit is worth 6c a lb to the grower.

Compared with the labour involved in copra making for small returns this is money for jam. Nevertheless Nieueans would be grateful if someone would kindly produce an insect to do the job. Then they could sit back and watch the money roll in.

The pulp exported to New Zealand was worth $39,000 last year and $48,000 the year before.

The pollenation problem was among a number discussed during the visit of Mr Amos, Minister of Island Territories, to the island.

Commercial production (apiaries with 300 or more colonies) in 20 major producing states accounted for 55% of the nation's 1972 honey crop. The yield per colony was 73.1 pounds and compares with the United States average of 52.8 pounds.

Greece is at the top of all countries in the world from the point of view of number of bee swarms per square kilometre and also the first from the point of view of quality of honey.

THE AMERICAN BEE JOURNAL—A monthly magazine published at Hamilton, Ill., 62341, USA. Subscriptions: 1 year $4.75, 2 years $8.75, 3 years $12.25 (all US).

By Assistant Professor Alphonse Avitabile
University of Connecticutt at Waterbury, Conn.

Alarm Pheromones of Honey Bees

Pheromones are chemical substances secreted by animals to convey information to, or influence the behaviour of, other animals of the same species. Although the term "pheromone" is less than 15 years old, the possibility of chemical communication among animals was noted by Huber some 150 years ago as he observed the reactions of bees to certain chemicals present in and on the sting apparatus!

Pheromones play an important role in the behaviour of bees, and are therefore, of interest to beekeepers and researchers alike. Honey bee pheromones alert bees to danger, stimulate aggression, and enable the hive to mark an intruder.

Two key pheromones involved here are iso-pentyl acetate and 2-heptanone — generally referred to as **Alarm Pheromones.**

The mandibular gland of the worker bee is the source of 2-heptanone. This alarm pheromone is present in large quantities only when bees assume guard and foraging careers. The chemical is absent in young bees, and is not found in queens or drones (2-3).

Iso-pentyl acetate is associated with the sting apparatus. The specific gland or glands involved in its production have yet to be identified. This substance has an odor somewhat similar to banana oil and beekeepers may recall this odor after having been stung. This second alarm pheromone is not found in significant quantities in worker bees until they have reached the age when they assume guard and foraging careers. It is absent in the sting apparatus of the queen. Drones have no sting and do not produce or respond to alarm odors(4).

The actions of disturbed bees may be observed when a beekeeper removes the hive cover. Guard bees erect their abdomens, open their sting chamber and protrude their sting. Sometimes a droplet of venom appears at the tip of the sting(5). The scent of the sting, however, is a complex mixture of chemicals, and only one of the several active components of the sting scent is iso-pentyl acetate. After assuming this erect-sting position, the guard bees may run buzzing among the colony. During the winter, alarmed bees on the exterior of a cluster assume a similar position, and the surface of the cluster appears like a porcupine!(6). Quite possibly, these bees may grip the combs or frames with their mandibles, thus releasing 2-heptanone. The chemical serves to alert other members of the colony.

Bees in the hive interior may be provoked by the alarm odor and attack. In the process of stinging the intruder, the bees may also grip his skin or clothing with their mandibles, thereby depositing the mandibular scent on the skin or clothing of the intruder. Thus 2-heptanone is left in the area gripped by the mandibles while iso-pentyl acetate is left in the area of the sting. The intruder has not only been stung but marked as well. The odor of these chemicals excites other bees; these bees in turn then sting in the same general target area.

NELSON BREVITIES

Nelson is actually North of Wellington.

Nelson has been a city for 114 years (1858-1972).

Nelson is the geographical centre of New Zealand.

Nelson's population (statistical area) is in excess of 68,000.

Nelson City has 1,597 beds in Hotels and Motels.

Nelson's Golden Bay boasts the world's largest freshwater spring.

Nelson has two National Parks and a Forest Park.

Nelson has the country's largest fruit-growing area.

Nelson is the only place in New Zealand where tobacco and hops are commercially grown.

Nelson plays host to 100,000 visitors annually.

Nelson caters for all forms of sport.

Nelson employs 3,000 seasonal workers at harvest time.

Nelson's exotic forest covers 80,000 acres.

Nelson Harbour Board has reclaimed 120 acres of land for industrial use.

Nelson has a new Civic Hall known as Trafalgar Centre—an all-purpose hall containing 35,000 sq. ft. and capable of accommodating the largest Conference with full catering facilities, etc.

Nelson's Tahuna Beach has the largest Motor Camp in New Zealand.

Nelson's Boulder Bank is a natural phenomenon.

Nelson is a paradise for trampers.

Nelson's Takaka Marble is 98% pure.

Nelson's Golden Bay is a "must" for visitors.

Nelson is famous fir its sunshine.

Nelson has tame eels in the Anatoki River.

Nelson has the country's biggest cement works.

Nelson is the mineral province of New Zealand.

Nelson has a 216 bed International standard hotel with conference rooms and heated pool.

DOMINION CONFERENCE

NELSON—JULY 11, 12 and 13, 1973

Conference 1973 will be held in the St. Mary's Hall in Manuka Street, Nelson. There is ample parking facilities at the hall.

A meeting of the National Executive will take place on Monday and Tuesday prior to Conference. Conference business will be from the morning of Wednesday, 11th July to noon on Friday, 13th July. There is a trip to the Cawthron Institute arranged for Friday afternoon.

The "Get Together" on Tuesday night will be held in the same hall at 8 p.m. for beekeepers, wives and friends.

Sightseeing trips will be available for wives and those not attending the business sessions. One trip has been arranged to Teal Valley Pottery and Weaving Loft.

A Cabaret has been arranged for Thursday evening 8 p.m. - 12 p.m. to facilitate catering arrangements for this evening, reservataion for tickets $4 each) by all delegates and visitors must be made as early as possible and not later than the 2nd July to:

PHILIP CROPP, 118 Hill Street, Richmond, NELSON

ACCOMMODATION GUIDE

A reservation has been made for the executives and members of the H.M.A. at the Metropolitan Hotel. Hotels and Motels within easy distance of the conference are:

Hotels:—

Dominion, 2 Nile St West — Daily $8.35 — Bed and Breakfast $5.40.
Nelson, Trafalgar St — Bed and Breakfast from $17.00 twin.
Wakatu, Collingwood St — Daily $9.85.
Naumai Private Hotel, 8 Bridge Street — Bed and Breakfast $4.25.
Rutherford, Nile St East — $17.50 twin room.

Motel Flats:—

Cawthron Travel Lodge, 199 Milton St — $9.00 2 people. $2.50 each extra adult.
City Motel, 50 Waimea Road — $9.00 2 people — $2.00 each extra adult.
Leisure Lodge Motel, 40 Waimea Road — $9.00 2 people — $2 each extra adult
Fletcher Motel, 22 Tasman St — $7.50 2 people — $2.50 each extra adult.

Motels at Tahunanui:—
(3 miles from city):—

Tahunanui Motel, 33 Golf Road — $6.00 2 adults $1 each extra adult.
Goodmans Motel, 98 Parkers Road — $8.50 2 people — $3 each extra adult.

Nelson City has 1597 beds in hotels and motels but is also host for 100,000 visitors annually so don't delay, book your accommodation straight away.

The host branch welcomes all visitors to Nelson and every effort will be made to make their stay in the sunshine city as happy and enjoyable as possible.

All beekeepers and their wives are welcome to attend Conference. Voting at Business Meetings is by a special formula as laid down in the Rules.

CABARET RESERVATION

I require ..... tickets at $4.00 each for which I enclose $.....

Name .....

Address .....

.....

HONEY MARKETING AUTHORITY

NEWSLETTER

The Authority has had two meetings recently, one in March and one in April, and at both meetings the main business was in connection with honey sales and prices on the local markets taking into account the continuing high overseas prices.

To date the Authority's intake is 1414 tons, and over 800 tons have been sold to Japan at prices according to grade, of up to 39 cents per pound F.O.B. These prices will return the Authority a net figure in excess of 30 cents per pound. Because of these prices, and having regar dto the fact that overseas returns have exceeded local realisations for the past 18 months, the Authority approached Government to allow it to increase its selling prices on the local market. Government's reply was a letter from the Minister of Agriculture, Mr Moyle, requesting the Authority to immediately announce that its payout for this season would be 20 cents per pound.

Extract from Mr Moyle's letter dated 28/3/73:

> "I think it would be true to say that bulk suppliers regarded last year's payout of 18.5 cents as highly satisfactory. An increase of 1.5 cents should be adequate to meet any subsequent increases in operating costs. In these circumstances I have decided to ask the Authority to make an immediate announcement that the payout for the 1972/73 season will be fixed at 20 cents per pound for honey grading 100 points, with other grades payable pro rata. I would be reluctant to issue a direction pursuant to section 17 of the Primary Products Marketing Act 1953, and trust that the Authority will regard the limitation of its payout as a measure that it should take in the interests of orderly marketing of honey and for the benefit of the beekeeping industry generally."

The Authority has informed Government that it will not accede to this request to announce a payout of 20 cents.

Mr Moyle's letter was written the day before he left for a four week overseas trip and Government will not make any further decision until he returns to N.Z. When he was in New York Mr Moyle was quoted following a visit to a store retailing meat as saying "If we're going to supply the world market and accept these high prices, we've got to face up to increased meat prices at home. As an exporting nation there is no doubt we have got to face the fact that our domestic meat prices will reflect the world trend. We've got to condition the public to it." In view of these comments (in which the word "honey" could well be substituted for the word "meat") I sent Mr Moyle a cable gram reading:

> "Interested to read in newspaper your comments on retail meat prices in U.S.A. stop. Would be pleased if you could find time to similarly survey retail honey prices for comparison with NZ prices during remainder of tour."

In our approach to the Minister Mr Ecroyd offered to produce figures to prove that honey producers needed a gross return in excess of 25 cents per pound in order to obtain a return on the capital invested in their business and an adequate wage for their labours. He compiled figures using actual profit and loss accounts made available to him by South Island beekeepers, and thesefigures showed that given average crops as estimated by the Department of Agriculture that a price of 29 cents per pound would be needed to give the beekeeper a wage of $5,500, a return on capital of 8%, and to set aside the amount claimed by him in his tax return as depreciation. It was pointed out to the Minister that many beekeepers are remaining solvent only by living off their depreciation.

In the course of the discussion held with Mr Moyle on 13th March he indicated that it was proposed to institute a levy scheme on meat along the same

lines as proposed for honey, that is, the producer would receive a price which was an average between the high overseas price and an artificially low local price. When Federated Farmers and others connected with the meat industry objected to this the Government decided not to implement the proposal, but to subsidise local sheepmeat prices by 2 cents per pound. Following the announcement of this I sent the following telegram to the Minister:

"In view of your decision not to impose a levy on export meat to subsidise internal prices I presume the same decision will apply to honey prices stop. If local prices need subsidising then a payment from the Consolidated Fund as for sheepmeat is quite acceptable stop. Because of your impending overseas visit an early reply is requested."

The Minister's reply to this was the letter quoted from above requesting a 20 cent payout.

To date the position is that there is no restriction on the Authority's possible payout, and strenuous efforts are being made to ensure that no restrictions are placed on the Authority's payout by Government.

Throughout all these negotiations I have kept the National Beekeepers Association fully informed, and they have also made representations to the Minister. I have set out the sequence of events fairly fully in order that you may appreciate that both the H.M.A. and the N.B.A. have been doing everything possible to persuade the Minister to a line of thinking which will give beekeepers the same benefits from high overseas prices as other primary producers have been getting.

OTHER BUSINESS DISCUSSED AT THE LAST TWO MEETINGS:

Firm action is being taken to have outstanding seals levy accounts paid. Action is also being taken in connection with sales of honey in respect of which no sales levy has been paid.

Alterations are almost complete at both South Island branches to enable them to handle 44 gallon export drums. Mr Merritt, Manager of Pleasant Point Branch has been given the additional position of South Island Manager. This will give the Authority more direct control over the South Island Branches and depots than has been possible in the past when all queries had to be referred to Auckland.

Private exports of packed lines were restricted to already established exporters to their established markets, and the maximum size for a retail export container was set at 5 lbs or 2.5 kilograms.

Further improvements to the Auckland plant by replacing galvanised piping with stainless steel were approved.

The Authority has been restricting the amount of honey it will sell on the local market to 20% of the amount sold in the same month last year. When this restriction was imposed in February it was hoped that it would be able to lift it in a short time, following a favourable reply from Government to our application for a price increase. As we are hopeful for a favourable reply we have increased our allocation to 50% of last year's figures, and will revert to unrestricted selling as soon as prices can be advanced to a satisfactory level.

As indicated earlier the intake to date is 1414 tons. This very satisfactory figure is due in large part to the offer of the ½ cent early delivery bonus and it is pleasing to find many beekeepers taking advantage of this. Unfortunately it caused a pile-up of sample for grading in Mr Rope's office, as he is limited in the number of samples he can taste in a day and still give a fair assessment of the honey. The large inflow also caused difficulties at some depots, but it is hoped that the extra payment will compensate beekeepers for any inconveniences they may have experienced.

R. F. Poole
Chairman.

Jottings From Bee Craft

Extract from an advertisement cutting received recently. Headed SOLITARY BEE CELL—a novel and fascinating garden interest for young and old. See some of the lovely, gentle Solitary Bees, choose their cells, store them with honey and pollen and lay their eggs. Then watch closely, the change from egg to larva, cocoon to Bee. Send £2.20 . . . !

RETAIN FOR REFERENCE

NEW ZEALAND HONEY MARKETING AUTHORITY

ELECTION OF MEMBERS

1973

The election of two producer members of the New Zealand Honey Marketing Authority will be held August/September 1973.

The members retiring by rotation are:

A. K. ECROYD — CHRISTCHURCH
J. W. FRASER — RYALL BUSH

The dates in connection with the election which should be noted:—
Rolls available for inspection — 14 days from July 25 - August 8.
Roll closes — August 8.
Nominations close — noon August 15.
Poll closes — noon September 12.

All correspondence in connection with the election should be addressed to:
The Returning Officer,
Honey Marketing Authority Election,
c/- P.O. Box 1879,
WELLINGTON.

NOT The New Zealand Honey Marketing Authority.

PERSONS ELIGIBLE FOR ELECTION

A person shall be eligible for election as a producers representative if:
He's the registered owner of at least 30 colonies of bees.
He has been nominated in writing by one or more producers or nominees of a corporate body whose names appear on the roll.
He has by writing in the prescribed form or by letter or telegram to the Returning Officer accepted nomination.
He has within 7 days of accepting nomination paid to the Returning Officer a deposit of $6.00.

A form of nomination will be found on page 21.
Nominations must be received by noon of 15th August, 1973.

VOTING QUALIFICATION

You are entitled to vote at the election if within the period from 1st July 1971 to 30th June 1973 you have supplied honey to the Authority or to a packer, or have paid levy to the Authority on honey which has been sold.

Votes are allocated at the rate of two votes for every two tons of honey supplied or the equivalent of levy paid during the two year's period, up to a maximum of 30 votes. If you have supplied less than one ton of honey you will not be entitled to vote. If you have supplied one ton or more but less than two tons you will be allocated two votes. The suppliers to the Authority should note that in order to qualify for votes, consignments of honey must reach the Authority's depots or branches by 30th June 1973, or be held by the supplier on behalf of the Authority and on which the Authority has paid a "pro rata" or "in shed" advance payment.

COMPANIES, PARTNERSHIPS

The attention of producers operating as companies or in partnership is drawn to clauses 2 and 3 of the Schedule to the Honey Marketing Authority Regulations 1964 which reads as follows:

> **"If an apiary producing honey for sale is occupied by two or more persons jointly or in common only one of those persons shall be entitled to vote."**

Any producer being a corporate body may by writing under its corporate seal delivered to the Returning Officer appoint some person whose name shall be entered on the roll as a voter on behalf of that corporate body.

A form of appointment will be found on page 21. It should be noted that this year's appointment shall remain valid until such time as notification of amendment or cancellation is received by the Returning Officer. Please attend to this matter promptly to ensure correct listing on the roll. No reminders will be issued.

INCLUSION ON THE ROLL

Those who have supplied the Authority or have paid levy to the Authority will be automatically on the roll with votes allocated according to the quantity of honey supplied or the amount of levy paid.

If you have supplied a packer you should obtain from him a written statement as to the amount of honey supplied to him during the two year period. A form of declaration for this purpose will be found on page 20. This form should be sent to the Returning Officer as soo nas possible after 30th June, 1973 but in any case no later than 8th August which is the date the roll closes.

PLACE WHERE ROLL MAY BE INSPECTED

In accordance with the regulations copies of the roll of producers qualified to vote will be deposited at the Ministry of Agriculture and Fisheries, Head Office, and at Auckland and at the following Post Offices:

Alexandra	Greymouth	New Plymouth	Tokoroa
Amberley	Hamilton	Oamaru	Timaru
Ashburton	Hastings	Ohaupo	Waimate
Balclutha	Hokitika	Paeroa	Waipukurau
Blenheim	Huntly	Palmerston North	Wairoa
Christchurch	Invercargill	Rotorua	Waitoa
Cromwell	Kaikohe	Roxburgh	Wanganui
Culverden	Kaikoura	Tauranga	Warkworth
Dannevirke	Kaitaia	Taupo	Whakatane
Dargaville	Levin	Taumaranui	Whangarei
Dunedin	Masterton	Temuka	Westport
Eketahuna	Matamata	Te Aroha	Winton
Geraldine	Motueka	Te Awamutu	
Gisborne	Napier	Te Kuiti	
Gore	Nelson	Tirau	

The rolls will be open for public inspection during the ordinary office hours for 14 days from 25th July, 1973.

Any person who is remote from an office where a roll is available for inspection may write to the Returning Officer for verification that his name is on the roll. The full name of the person concerned should be supplied and the enquiry should be made during the period the roll is open for inspection.

IF YOU ARE NOT ON THE ROLL

If you find by inspection of the roll or by writing to the Returning Officer that your name has not been included on the roll or that the number of votes allocated is incorrect you may write to the Returning Officer to lodge an objection giving information on the quantity of honey supplied or the amount of levy paid. Provision is made in the regulations for the issue of special voting papers where the voter's name has been omitted from the roll. In previous elections supplementary rolls have been prepared and copies sent to persons whose names have been brought on to the roll after the main roll has closed.

There is no statutory obligation to publicise supplementary rolls even on a limited basis. In this election therefore, the Returning Officer will amend the roll and issue special votes, if he is satisfied that this should be done, but copies of the supplementary roll will not be made available. It is most important that any objections to the particulars on the main roll be made promptly.

WHEN YOU RECEIVE YOUR VOTING PAPER

Before you exercise your vote read the instructions carefully. Mail the voting paper to the Returning Officer in sufficient time for it **to be received by him by noon on 12th September, 1973.**

DECLARATION FORM

(This Declaration Form is for the use of producers who are entitled to votes as suppliers to packers. See previous reference.)

IN THE MATTER of the Honey Marketing Authority Regulations 1964.

I, ... (Full name)

of ..... (Address)

..... (Occupation)

do hereby solumnly and sincerely declare as follows:—

1. That during the year ended on June 30, 1972, I supplied to

..... (Full name)

of ..... (Address)

..... (Occupation), who is a packer of honey

..... lbs. of honey (in respect of which I did not purchase any honey seals.)

2. That during the year ended on June 30, 1973, I supplied to

..... (Full name)

of ..... (Address)

..... (Occupation), who is a packer of honey

..... lb. of honey (in respect of which I did not purchase any honey seals.)

AND I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths and Declarations Act, 1957.

DECLARED AT .....

By the said .....

.....
(Declarant to sign here)

.....
(Full name)

this ..... day of .....
1973, before me

.....
A solicitor of the Supreme Court of New Zealand or a Justice of the Peace

This form to be forwarded to — **THE RETURNING OFFICER**
P.O. BOX 1879,
WELLINGTON.

As soon as possible after 30th June, 1973 but no later than 8th August, 1973. Further supplies of these forms may be obtained from The Returning Officer.

NOMINATION OF PRODUCERS' REPRESENTATIVE ON THE N.Z. HONEY MARKETING AUTHORITY

Nominations Close Noon August 15th, 1973

I (We), the undersigned voter(s), do hereby nominate

..... (Full name)

of ..... (Address)

..... (Occupation)

with his consent, as a candidate at the election of persons for appointment to the Honey Marketing Authority established by the Honey Marketing Authority Regulations 1964.

Date at ....., this ..... day of ....., 1973

Signature of voter .....

Full name of voter .....

Address of voter .....

I, ...

do hereby consent to the above nomination.

Signature of Candidate .....

Within seven days of accepting nomination each candidate must deposit $6 with the Returning Officer.

APPOINTMENT OF NOMINEE BY A CORPORATE BODY OR PARTNERSHIP TO BE ENTERED ON ELECTION ROLLS

..... (Name of Body or Partnership)

of ..... (Address)

hereby appoint

..... (Full name)

of ..... (Address)

..... (Occupation)

as nominee, to be entered on the rolls of the Honey Marketing Authority Election.

as voter on behalf of said .....
(Registered Name of Body or Partnership)

Date at ....., this ..... day of ....., 1973

.....

.....

.....

This form to be forwarded to:—

IF COMPANY COMMON SEAL

THE RETURNING OFFICER, P.O. BOX 189, WELLINGTON
As soon as possible after 30th June, 1973,
but no later than 8th August 1973.

IF PARTNERSHIP
SIGNATURE OF THE MAJORITY OF PARTNERS

This appointment shall remain valid until notice of amendment or cancellation is received by the Returning Officer.

Letters to the Editor

R.D.2, Titoki, Whangarei.
18th May, 1973

Sir,

It has been reportted to me that the present Chairman of the H.M.A. announced at a recent Southland Branch Meeting that he has sold his bee-keeping business to work for A. Ecroyd & Sons Ltd.

If this is true, we have a Chairman who works for a member of the Authority and who has no hives to justify his interest. This is wrong in principle on both counts and I look forward to reading in your pages that he has resigned.

The Authority is already unrepresentative of the industry and the present five members together produce less honey each year than my modest output. Surely the time has come for a minimum hive qualification for election to the Authority. We cannot otherwise be represented at all.

TERRENCE C. GAVIN

Weenick Road, Karoro, Greymouth,
3rd May, 1973

Sir,

I think that at present you are the unknown quantity, like a new broom, trying to clean up and revitalise interest in a fragmented association from the sideline.

Many will say, "No N.B.A., no Journal". Let the present Association fold and I am sure Hobby Clubs and local discussion groups will take over. Unless there are some drastic changes within the N.B.A. I cannot imagine any significant increase in members.

One point of discontent is the delegates' vote. At present those with up to 20 hives have no vote.

I think the Journal should be the mouthpiece of all groups in the industry from hobbyists to commercial operators, breeders and pollen service boys, and to some extent packers, distributors and consumers. The last two groups we need urgently.

As soon as possible could you please clarify two points under headings, "Beekeepers' Journal and Subscriptions," as recorded on page 3 of February 1973 issue.

TOM HOLLAND

Abridged.—Ed. (See inside back cover for answer to the last paragraph.)

157 Carlisle Road,
Browns Bay,
Auckland, 10.
12th April 1973

Sir,

I feel it is time more co-operation was given by Executive with the H.M.A. In your last two or three sets of Executive minutes it appears to me you are making great efforts to co-operate with the Packers Association, an organisation whose leaders have never shown any desire to co-operate. I hate to think what our industry would be like if fellows like this were allowed private exporting.

BOB BLAIR

Drummond No. 8 R.D.
Invercargill,
11th May, 1973

Sir,

At a meeting of the Southland Branch of the N.B.A., held in Gore on the 3rd May 1973, the chairman of the N.Z. Honey Marketing Authority stated: "I have sold my hives and will be going to work for A. Ecroyd & Son Ltd., providing the industry has no objection I will continue in my capacity as chairman of the H.M.A."

The chairman has obviously lost sight of the fact that man cannot serve two masters.

Considerable embarrassment is already being experienced by several beekeepers who are obliged to purchase beekeeping supplies from Mr Ecroyd and on the other hand oppose him politically as a member of the H.M.A. One man in this situation is bad enough. To have two is intolerable, irrespective of the regard in which these men are held.

Under the present system a producer who neither pays levy nor supplies the Authority with honey is eligible for election to the Authority. *I believe this is wrong in principle,* because a beekeeper who neither pays levy nor supplies the H.M.A. with honey is certainly not allowed to vote at elections.

Messrs Poole and Ecroyd are both implicated in this moral aspect and their resignations would pave the way for the removal of a gross anomoly.

At the moment the N.Z. Honey Marketing Authority has two hobbyist beekeepers and one part-time beekeeper and only one commercial beekeeper on its Board. I am sure no other single N.Z. industry is so badly represented. Certainly no statutory controlled industry, anyway.

No wonder our industry is sick.

J. A. DAVIES

No. 5 RD, Gore
21st May, 1973

Sir,

The Executive of the National Beekeepers Association consists of Members who produce large quantities of honey. This is good, but they also supply the Honey Marketing Authority and so favour the retaining of the levy in its present form as it has helped in their payout in the past.

On the H.M.A. Board the members are becoming token members, that is, they register just enough hives to qualify to be eligible to stand as members. I have nothing against any of these gentlemen. Admittedly, one or two producer members supply quite large quantities of honey and as such do not contribute to the levy, or perhaps in only a small way.

Since the levy does so much for the N.B.A. and the H.M.A. they are anxious to retain it, while packers on the local market have sought to have it removed.

The levy will, in fact, under existing conditions increase the reserves account which will also be enlarged by large sums of money being held back from being paid to suppliers by Government decree. Does the N.B.A. and the H.M.A. and the Minister of Agriculture and Fisheries really wish to continue a levy of 1¼ cents per pound on honey to the housewife merely to enlarge this fund.

And the burning question is, will this money held back be lost to the industry if it is indeed under the control of the Minister.

W. S. HERRON

---

69 Cluny Road,
Plimmerton
16th May, 1973

Sir,

It is time we did some "Public Relations" to correct the wrong impression prevalent in some quarters that honey as marketed is doped with sugar, flour etc. We must emphasize that it is only the pure honey which comes from the beehive, any additives can be easily detected.

Also, sometimes the news media are at fault when they, for example, report that apiarists are complaining about the price of sugar to feed bees. This can be interpreted somehow as something which is being added to honey either by the beekeeper or the bees and the resulting publicity does nobody any good. We might be better to use some other term to define this feed sugar such as bee syrup or granulated bee food.

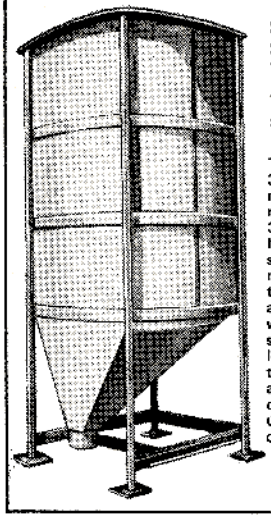
Like most beekeepers I am sick and tired of being accused of adding sugar to my honey. I can only recall one factual case where this happened; the practise soon had the unfortunate beekeeper in the bankruptcy court.

Could some member of the H.M.A. or N.B.A. executive please take action on these matters?

JIM GYTON

George and Ashton fibreglass storage and supply tanks

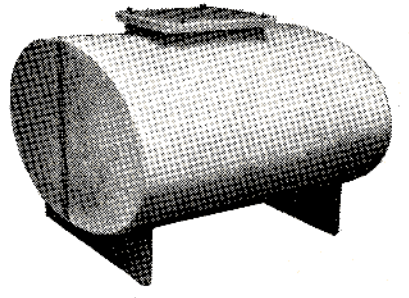
strong, light, easily cleaned, jointless, hygenic



SILO STORAGE TANK

for bulk supply honey

This tank can hold 3 tons of honey, measures approximately 8' deep x 3' x 3', and can have a built in sight gauge or be made completely **translucent.** It can also be supplied with or without a stand in a high or low position, so that if necessary a 44 gallon drum can be placed underneath the outlet.



SUPPLY TANK

This of 200 gallons capacity and is suitable for the water/sugar mixture used for bee feeding. It is also ideal for crop spraying etc. This tank can also have a built in sight gauge or be completely **translucent.** It has a detachable hatch and can be supplied with or without a stand.

Fibreglass containers are stain and acid resistant and can be used for all types of chemical or food storage. Cast-in colours make for easy visual identification and promote safety. Fibreglass containers can also be adapted to any installation or designed as both storage tanks and dispensers. These containers are available in standard shapes and sizes, but can also be custom made to suit your particular requirements. These fibreglass units meet with Dept. of Agriculture approval.

AHI George and Ashton Limited

P.O. Box 2056, South Dunedin, Phone 54-108 or 54-109.
P.O. Box 12.069, Penrose, Auckland, Phone 596.617.

Apicultural Research and Developments into the 1980's

A talk presented to Beekeepers at a Field Day at Lincoln College on March 2, 1973.

By Murray Reid, Apicultural Advisory Officer

A recent report by a Joint United States Department of Agriculture and State Universities task force, into the research programme on bees and other pollinating insects, came up with the finding that the use of bees for honey production should be secondary to their use for pollination.

They also recommend that the level of effort by 1977 be increased from the 1966 recommendation of 31 to 55 scientist man years, with principal emphasis on pollination.

Beekeepers have traditionally earned their living primarily from honey and wax sales. With the changing pattern of agriculture in Canterbury we may have to become "commercial pollinators" of various crops. This will mean new management techniques, new equipment, new knowledge of crop phsiology and even new bees. What will science be doing to help us?

We'll have a new bee for a start. Bees will be bred specifically for a particular crop such as lucerne, red clover, fruit trees and many others. We have already bred a strain that prefers to gather lucerne pollen and are working on ones for cotton, cranberries and almonds.

How are we in New Zealand to get these types of bees? I don't think we have the resources to do the breeding and selecting ourselves, rather we will be importing strains from overseas. One way is to import stored drone semen in capillary tubes. We have the ability to do this now although we still can't be sure that there will be no EFB contaminating the semen.

The technique of artificial insemination will be widespread and our commercial queen breeders will use it extensively. There is evidence that behaviour characteristics such as nectar and pollen collecting, stinging, swarming, comb building, propolis depositing and so on are genetically controlled. It will be possible to breed for or against any desired combination of these characteristics once the relationship between the genotype and the phenotype is known. For example swarming ought to be reduced to near zero point, just as broodiness in White Leghorn hens has been greatly reduced.

Meanwhile, what is the plant geneticist doing? He is busy breeding hybrid varieties such as cotton, cucumbers and safflowers that must have pollinators to effect cross pollination in normal or male-sterile flowers. He is also busy selecting varieties or lines that are more attractive to bees, e.g. lucerne with recessive flower keels and tetroploid red clover with short corollas.

The plant physiologist is extracting, identifying, and synthesising the volatile compounds of bee pollen and nectar. With these compounds we will be able to train or enduce bees to visit certain crops. These compounds will also make substitute foodstuffs more acceptable to the bees. Natural spring forage in the Canterbury plains will be at a minimum so we'll need to feed substitutes especially protein, for the early stimulation of brood rearing. Some of these compounds have been identified already; for example one of the attractant chemicals in pollen has the interesting name of octadeca-trans 2, cis-9, cis-12 trienoic acid.

What about new equipment? The basis of our whole industry, the hive, will be modified. The hive of the future will be plastic and probably incorporate insulation in its walls. It will be impregnated with chemical attractants such as queen substance or the brood pheromones to entice the bees to stay when initially hived. I envisage a hive very similar to the catenary design (**N.Z. Beekeeper** — May 1969) with one large brood box.

The combs are semi-eliptical in shape with the rounded base characteristic of "wild comb". They are built naturally by the bees from starter strips of foundation. These single brood box hives with their carrying handles on each side are highly manoeuvrable for pollination purposes. The combs are the "warm way" around, the entrance is elevated so there are no problems with cold draughts or mice, and foraging bees do not need to go through the brood frames to reach the honey supers.

Honey supers themselves will be ¾ depth in size. Labour regulations such as are being proposed in the United States at present, will prohibit any farm worker from lifting over 50 lb in weight. The combs themselves will be similar to the Manley honey frame and made entirely of a heat resistant plastic that is acceptable to the bees. Such combs will be fed on a continuous chain system into microwave ovens for extracting. These revolutionary type ovens create high energy waves that penetrate very rapidly into anything in their path and provide instant heat. In a sense, objects subjected to microwaves are heated from the inside out. The resulting honey-wax mixture would run away into a baffled tank when the wax would separate off as under present systems. This wax would be drained into a large heated tank and emptied into moulds at the end of the day. The honey would be strained and tanked as per usual. Such an extracting system obviates the necessity for hot rooms, uncappers, separate equipment for handling cappings, and possibly extractors as well.

If the brood frames were also made from these chemically inert and heat stable plastics, hives infected with disease or wax moth could be easily sterilised using chemical means, heat treatment, or high energy radiation such as cobalt gamma rays.

MANAGEMENT PRACTICES

Most of us will be concerned with supplying colonies for pollination either in the field, under glass, or more likely under huge air inflated plastic domes. Strong colonies will be reared early in the spring using pollen substitutes incorporating artificial chemical attractants. These will be split into 4-5 disposable units made of carboard or plastic and maintained in a queen-right condition by the use of synthetic pheromones simulating the presence of a queen and uncapped brood.

Queen rearing and colony manipulation will be made easier by the use of synthetic chemicals in aerosol cans. An excessive amount of queen substance or an alarm pheromone squirted into a hive will enduce the bees to kill their queen. A new cell or queen can be introduced when the colony has returned to a "queen-less state". Stinging will be controlled by a pacifying pheromone extracted from drones. Smokers will be a thing of the past and probably prohibited on the grounds that they Cause pollution and are a fire risk!

Biological control of insect pests will be pre-eminent but some low residual species-specific insecticides will still be in use. There is a saying that if the mountain won't come to Mohammed then Mohammed must go to the mountain. In our case if we can't keep insecticides off plants then we must keep the bees away from the insecticides. With the new plastic hives and combs mechanical vibrations can be transmitted through them quite easily. Vibrations of between 500-100 hz cause bees to "freeze" on the combs and thus remain in the hive long enough for the pesticide to lose most of its toxicity.

If our honey won't be coming from the plains, where will it come from? The obvious answer is the bush areas of the hills and the West Coast, plus the honeydew beech forests. Helicopters will be used to transfer whole apiaries into bush sites thus exploiting areas otherwise inaccessible. Large centralised extracting units will be built to handle the honey from these sources. Some honey will be moved in 44 gallon drums but most of it will go by bulk road or rail tankers. Compressed air will be used to load and unload these tankers.

Nectar for Novices: A Section for Hobbyists, Amateurs and Others

By Paul Marshall, Hastings

Making a Start

As a hobby, beekeeping has many advantages. This applies especially to those interested in nature study plus the very practical advantage of the rewards of honey for one's own consumption.

The Hobbyist has an advantage over his commercial counterpart in the more smallness of his outfit. This should be no more handled in the available spare time. On than the number of hives which can be the other hand, the commercial apiarist has a larger number of hives which have to be operated both efficiently and economically. The pressure of the economical running of his business does not always allow him time to observe and study his bees as much as he may possibly wish.

Before the prospective beekeeper takes the plunge and orders his hives, bees and other supplies, he is well advised to spend some time gathering up knowledge of his new hobby. A good deal may be obtained through reading but there is no substitute for getting alongside an experienced beekeeper for practical tiution.

Bee stings are inevitable, they are the most unpleasant aspect of the keeping of bees. Yet, every beekeeper must come to grips with this problem and it should be faced up to, especially to know your reaction and allergy, if any. For the beginner, the first sting will probably be a painful experience which may or not have side effects such as localised swelling. Generally speaking, as the total number of stings received increases over a period of time, so will some kind of immunity be built up to a more or less degree. This is little comfort but stings must just be accepted as one of the hazards of the hobby. Nor is there any comfort in know-

The Auckland Beekeepers Club Incorporated

President, Phil Muir, 25 Glenatkinson Street, St Heliers, Auckland 5. Secretary, Reg Sanderson, 72 St Heliers Bay Road, Auckland 5.

This club of about 160 members has its own apiary at Western Springs where demonstrations and lectures are held at regular intervals during the season. In the winter lectures and films are held indoors from time to time.

Phil Muir, the president, told us that the honey production from the club apiary was about half the normal expected this year because of the damage done by vandals early in the season with possibly some effect from the drought also.

Here is an extract from a recent Auckland Bee Club Newsletter:

"We will open all hives to check stores and if light, as they probably will be, we will feed them and inspect the brood chambers for old drone comb and replace. Drone comb is no good in the brood supers, just why is that so?"

The next meeting of the Club will be held on June 20th at 7.30 p.m. in the Department of Agriculture & Fisheries Cafeteria, opposite NAC in Victoria Street West, Auckland. Prospective members will be welcomed at this meeting which will include a lecture and a film.

Wellington Beekeepers' Association

President, J. M. Bodmin, 39 Hobart St., Miramar; Secretary, E. J. Gyton, 69 Cluny Rd., Plimmerton; News Letter Editor, Mr E. Tambourne, 49 Tennyson St., Petone.

This Association meets on the second Monday of every month (excepting January) in the YWCA Rooms, Willis St., Wellington. Membership is about 85 at present and is rising.

A monthly newsletter is published which is sent to members a few days before each meeting. It contains notes of interest, for sale and wanted to buy sections, also minutes of the previous meeting. It is also a valuable reference piece with the names of office-bearers and their telephone numbers.

As a community service we publish a full list of members once a year and send it to various police sattions, county rankers, the Department of Agriculture. In this way members are able to collect swarms for nothing.

Our Annual Meeting will be held on the second Monday in June so it is possible that some officers may change positions. Although most members come from as far away as Upper Hutt and Paraparumu and most places in between.

Field days are held in December to give members on the spot practise in what to look for in the hive. Invitation speakers are brought in from time to time and their controbutions are greatly appreciated.

Glass observation hives placed in prominent grocers shops have in the past helped to stimulate interest in honey. Recent feeling has been that this type of display would be more effective if used in conjunction with a nation-wide ing that the act of stinging costs the honey bee her life.

Should stings produce other than localised swelling, blotchy rash, increase in body temperature and/or difficulty in breathing, immediate medical attention is indicated. If these symptoms are produced after you are stung a discussion with your doctor is recommended before you buy any equipment or bees. It just may be that beekeeping is not for you.

Beekeepers, especially hobbyists or long experience are generally very willing to impart their knowledge to a newcomer who is genuinely interested in bees. There are a number of Hobbyist Clubs in different parts of the country and we will be publishing details of meeting places, times, dates as this information comes to hand. If you have some information which we have not published you will be helping others if you send a note off to the Editor right now, P.O. Box 4106, Auckland.

Beekeeping is a rewarding hobby. Before taking the plunge, however, one must be absolutely positive that this is "your thing" and you not only have the time available to look after the hives you are going to set up but also have the tenacity to stick to them when the glamour has worn off in a few months. Unfortunately there are too many remains of beekeepers who have lost interest in their hives in various parts of the country. These are a nuisance to both neighbours and local authorities. They are also a thorn in th eside of the local Apiary Instructors of the Ministry of Agriculture and Fisheries.

The next step, before ordering anything, is the selection of a suitable site for your apiary. You will not that wherever your bees are placed the site is always referred to as the apiary whether there are one or one hundred hives. As such it must be chosen for its shelter from prevailing winds, dryness underfoot, ease of accessibility and availability of pollen and nectar sources in the immediate vicinity.

Examples of good spring pollen sources are broom, gorse, and the many wattle varieties. Hawthorne and willow varieties provide nectar as well as pollen. There are numerous other sources of both pollen and nectar. The timetable of their flowering is of vital importance to the beekeeper as part of his apiary management programme.

Many town dwellers will find that their backyards are satisfactory on all the above points with the added advantage of convenience. However, before making a final decision, it is advisable to enquire from your local authority about any regulataions covering the keeping of bees in your area. If there is no objection from this source one must also consider one's responsibility to one's neighbours.

It is an unfortunate fact of life that bees have the ability to sting the wrong person or to persistently soil the neighbour's weekly wash with their cleansing flights. It is important in closely populated areas to locate the apiary behind a fence or wall or even a hedge which will help force your bees to fly up and over the heads of people on adjoining properties. There could be nothing worse to the person who is not interested in bees to be stung from time to time while in his or her own backyard. Should your property not meet all these requirements satisfactorily, look for a suitable place in the country.

For comfort and protection, special clothing is available which can be worn when working with bees. The well-dressed beekeeper will be equipped with a good hat, a gauge veil, combination overalls, a pair of beekeeping gloves and spats or puttees for ample leg protection and the prevention of bees finding their way up your trouser leg.

To say the least, a bee in such a position is very disconcerting. It is certainly going to sting, but the problem is where? Included with this outfit must be the hive tool for the manipulataion of combs and

"Eat Honey for Health" type of campaign. Perhaps the Honey Marketing Authority will take the idea up to use as part of a national promotion for honey some time in the future.

This Association has no connection with the N.B.A. but some o fits members belong to both organisations.

QUESTIONS and ANSWERS

Q. — Can you recommend some suitable books on Beekeeping which will be helpful.

A—There are not many books on Beekeeping in New Zealand in print. The Bulletin 267 published by the Ministry of Agriculture and Fisheries is worth reading as it relates to New Zealand conditions. Another book which is found on the shelves of most beekeepers is "The ABC and XYZ of Bee Culture" published by the A. I. Root Company of Medina, Ohio, U.S.A. A very comprehensive collection of books and other beekeeping literature has been established by the National Beekeepers Association and this is available for use by all members. The Honorary Librarian is Mr Chris Dawson, P.O. Box 423, Timaru, by whom details will be supplied.

Q — How does one make a start in Beekeeping?

A — I suggest that you purchase one or two of either the A6 or A9 kitsets from the Alliance Bee Supplies Ltd. These should be made up, painted and placed in their permanent location. As early as possible stock these hives with a nucleus of bees for each. Nucleii of bees as sup-

plied from a reputable beekeeper will usually contain two frames of pollen honey on either side of two frames of brood. A young queen with about 3 lbs of bees would also be included in each nucleus. This unit is ideal for the beginner. They will need feeding on being placed in the new hive and they will provide the opportunity for the hobbyist to see how a hive grows and develops through a season. If all goes well and the season is favourable this new hive with its nucleus and queen and bees could bring in a crop of honey to its delighted owner.

Q — What is the minimum number of hives you would recommend a hobbyist to start his beekeeping with?

A — I suggest two hives as the ideal. This will allow room for errors which are bound to be made. During hive manipulataion he will probably kill a queen, lose a swarm, or cause a problem in his hive. Should there be two hives he could still use the other for emergency supplies of brood.

Q — Is there anything special about the various designs of hive tools?

A — Hive tool preference is very much an individual matter of choice. Many shapes and sizes are in use as also are the odd screwdriver and an occasional chisel.

To save injured thumbs from hive tools slipping when prising supers apart, rasp a little off each corner of the box. When two boxes fit together there will be a gap just large enough for the hive tool to fit into.

Honey Face

Put one teaspoon of honey in a small jar and fill the rest of the container with witch hazel. Shake well. Keep in refrigerator when not in use. This is a great skin tonic.

the smoker, a most important part of the beekeeper's equipment. Used correctly with the right fuel of either dry pine needles or old clean sacking the smoke will help in keeping order while you are working about the hive. Ample cool clean smoke is provided by both these fuels. When this smoke is applied to the entrance of the hive the bees gorge themselves with honey and a bee gorged with honey cannot sting. The only problem remaining is that of the bees returning from the field who will be upset at finding their home being tampered with. Judicial amounts of smoke must therefore be given to the hive from time to time. However, controlling bees with smoke is only learned to perfection with experience. It is here that the practical instruction of a "master" is so important.

Choosing the right time of day to work bees is also helpful. The ideal is around midday in warm fine weather when there is a nectar flow on. Bees become more difficult to work in cooler temperatures and also from about 3 p.m. onwards when the nectar flow begins to taper off for the day.

Now that you have sorted out a suitable site and have all the necessary gear on hand, we can discuss the hive itself. A hive is a container which must provide the bees with shelter against the elements, a place in which they can live and bring up their young (known as brood), as well as providing storage room for food supplies.

In many countries overseas there are a wide variety of hive types and sizes. For example, in Great Britain they are confused by the British Standard, Dadant, Langstroth, the National Hive and others. Fortunately for both the amateur and the commercial man, most New Zealand beekeepers have standardised their equipment to that of the Langstroth design. The beginner may, therefore, buy either an established hive or a kitset knowing that the sizes will be the same.

Kitsets are available throughout the country from Alliance Bee Supplies stockists and may be bought complete for liquid or section comb honey production. These are the basic units on which one builds since extra storeys will be needed for the brood nest and for honey storage. The ideal set-up will have four full depth storeys for liquid honey or two full depth and two half depth storeys for section comb honey.

Once assembled and painted for protection the new hive can be stocked with bees in the spring. Bees are either purchased from a reputable beekeeper as a four or five frame nucleus of bees or one may wait for a swarm of bees. The nucleus has my recommendataion and it should be free of disease and headed by a young queen. If this is obtained early enough in the Spring it should build up to a good hive for honey production by the time the main honey flow is on.

Another alternative is to buy a hive already assembled and inhabited with bees. This brings up the ugly aspect of disease, especially Bacillus larvae. Tehre is no cure for this and once it has been discovered one must immediately destroy hive and contents by fire. To guard against this drastic end to your hives, alwavs consult your Apiary Instructor who will inspect your hives and advise you.

Now that you are a beekeeper you are obliged immediately to register your hives with the Ministry of Agriculture and Fisheries. Fortunately there is no charge for this registration. Also, we strongly recommend that you join the National Beekeepers Association of N.Z. Incorporated. A strong Association with every Registered Beekeeper a member is our ideal since in this way we can be of maximum service to each other. Also, as a side benefit, there is a reduction of $1 per year in the price of the "N.Z. Beekeeper" to members of the National Beekeepers Association.

Next Month Paul's topic will be, "How to Start Bees in a new hive."

Painting Hives

Many beekeepers are pennywise and pound foolish when it comes to painting their bee boxes.

Some, buy the cheapest possible paint, apply it in the quickest possible time, and, give their boxes the minimum possible number of coats and then expect their boxes to last a lifetime.

The most important coat is the first when the box is new and care should be taken in selecting a good quality paint,

Apply a good coat of red primer to all surfaces exposed to the weather and to the corners of the inside of your box. preparing the surface correctly and working the paint well into the wood.

Allow to dry overnight. Then, apply an oil base inside and out and be sure to work the paint well into the wood, next apply a white gloss to the inside and to the outside 2 coats of your favourite exterior gloss colour, remember to allow plenty of time between each coat for drying.

By painting your box correctly from the first coat plus regular maintenance, you can be sure of years extra life for your box.

HOBBYIST CLUBS

For the future we would appreciate any information which could be supplied to the editor on this any any matter of interest to beekeepers whether hobbyists or commercial operators. We would like the stimulus of this issue to be reflected in a greater flow of mail to the Editor's Office, P.O. Box 4106, Auckland.

Honey Price Control in Israel

Since the beginning of January, Israeli beekeepers have been refusing to sell honey to the shops. They are pro-

testing against government price controls. They complain that the government is forcing them to sell their honey for half of what it costs them to produce it.

The wholesale price for honey has been frozen for the last three years at 1.50 IL (15p) (about 25c NZ) a kilo. But the beekeepers say it costs them IL 3.15 to produce a kilo of honey. A number of beekeepers have been forced out of business and the rest are struggling along, not buying new equipment.

(One kilo is about 2.2 kilos.)

DISCUSSION GROUPS

At the instigation of Mr Varley, Apiary Instructor, fifteen amateur beekeepers met at John Bush's Honey House, Blenheim, this morning, Saturday, 14th April.

Mr Bush conducted the party through his commercial operations and explained his procedure and innovations as he went. "Necessity being the mother of invention," John Bush explained how he had introduced "Drip Trays" on the truck for harvesting, and had probably saved tons of honey during his harvesting trips. Honey which previously had to be washed away after unloading! Then, one year he was short of lids, and had found he could improvise with drip trays, inverted of course. He had promptly ordered another 100 trays, as they had proved so successful.

John doesn't use excluders, and once again exhibits the individuality of the true beekeeper. Dr Jefferies of Orpington, Kent, who guided me in my first beekeeping venture, will be delighted to hear of John's success with this particular practice.

Seasonal Work

During winter the pressure of work in the apiary is reduced. This allows the beekeeper time to prepare for the soming season. While most commercial beekeepers become immersed in the politics of the industry the hobbyist could be left out

If there is a hobby group operating in your area it will almost certainly be to your advantage to join up with them. It is surprising how many of these hobbyists have similar problems and who would welcome an interchange of ideas. Should there be no hobby group in your area, why not get a few together and start one? Your local apiary instructor may be able to give you help in locating kindred souls since he probably has a list of hive registrations as required under the Apiary Act.

Your hives should by now have been wintered down with ample winter stores of about 40-50 lb according to district to last the bees through until the spring. The entrance should be reduced in size to keep out mice who would most likely find the food and warmth of the hive very much to their liking but with disastrous results. During the coldest period of winter it is advisable to disturb the bees as little as possible since they will most likely be in their cluster.

If you feel the need to check the food stores the operation should be carried out quickly and with the least possible disturbance to the bees. The experienced beekeeper frequently does no more than feel the total weight of the hive to gauge the food situation. The remedy for depleted supplies is the introduction of combs of honey kept for the purpose or feeding with sugar solution (syrup) made in the proportion of 2:1 water to sugar.

There are as many ways of doing this feeding as there are beekeepers but I have

found to be the inverted 5lb tin on the top frame. A hive mat with a hole in the centre for the tin is placed on two spacer bars which allow the tin of syrup to be suspended over the cluster of bees. There should be no more than three small holes in the lid of this invertted tin. If the holes are too big the syrup will leak out faster than the bees can consume it. Ideally the syrup is retained until the bees feed direct from the holes. Two problems may arise from this, or for that matter, any form of feeding which allows too much syrup to come through. One is that spillage can encourage robbing and the other that brood rearing can be stimulated too early in the season.

One matter of concern which affects beekeepers both in the North Island and in the northern part of the South Island is the care and protection of stored combs against wax moths. See illustration. The two species which trouble us in New Zealand are the greater wax moth, *Galleria*

John tried the bee blower, but found the noise upset the tranquility for him, and did not seem to speed up the operation, so he has a blower for sale. Any offers!

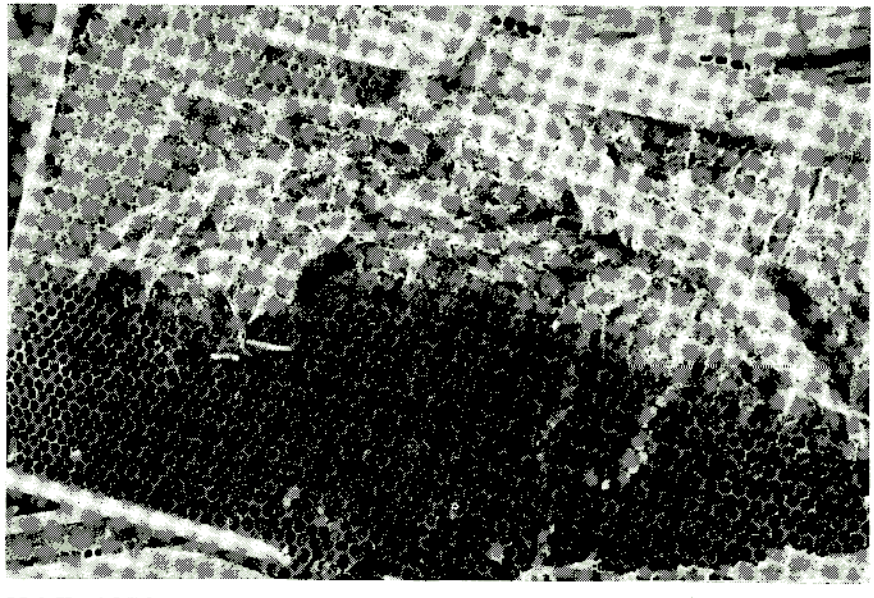
Equipment has to be tested and found useful, or discarded and perhaps tried again. Storage is the only problem.

John demonstrated practical hints in frame assembly which I, for one, will be trying out in the not too distant future. Beekeepers from Picton and the Blenheim area have decided to meet on the first Saturday in each month.

We are all grateful to Mr Varley to have had the opportunity to discuss bee business and to John Bush for giving up his time and sharing his knowledge and experience with us. We are all looking forward with renewed interest to the winter get-togethers.

—Report from E. D. Jefferies

Extensive damage to brood combs by wax moth.



POLLEN

It is believed that pollen is the most nutritious and concentrated food on this planet, the very life-force of plants. Pollen is the male fertilizing sperm of the flowers.

The bees gather pollen dust from the flower and form small pellets held together with nectar. Returning to the hive the bees drop these pellets through a collecting screen, and the pollen is then gathered by the beekeeper, who takes only a balanced portion to be used as food.

Pollen is a very rich source of protein, average 26%.

Vitamins: A, C, D, E, M, B1, B2, B3, B6, B12.

Minerals: calcium, phosphorous, potassium magnesium, iron, manganese, silicon, sulphur, chlorine, copper, sodium, titanium. Essential free amino acids 11%. Reducing sugars average 29%, frutose, glucose, stachyose, sucrose, raffinose, pentose. Vegetable oils average 5%. Water 3-4%. Biotin, Rutin, Digestive enzymes, lecithin, lactic acid, giumatic acid, peptones, growth hormones, sterold, vernine, guanine, xanthine, hypoxanthine, nucleim, poly peptides, DNA, hexuronic acid, ribose desoxyribose, and probably, many substances yet unknown to man.

Two teaspoons a day will nutritiously satisfy most adult requirements. Sprinkle pollen granules on breakfast cereals, sandwiches, ice cream, and other foods. Blend pollen with honey and water or fruit juice to make a delicious Ambrosia Drink — The Nectar of the Gods. Try pollen in smoothies. Make Ambrosia Baby Formula with pollen and almond or cashew milk.

Pollen is the perfect food for back-packing, hiking, bicycling, travelling, on long journeys, walks through the woods, or meditation retreats.

melonella and the lesser moth, *Achroia grisella*. Both have the uncanny knack of creeping into stacks of stored combs when one is not looking and creating untold damage.

Although the rate of infestation appears low at the moment these moths can still be present as eggs laid in cracks and crannies round the hives. When the warm weather comes these caps will hatch out into small white grubs which have brownish heads. These grubs grow rapidly and live on a diet of pollen and wax. Such an infestation is usually seen as grubs (lavae) tunnelling their way through the combs leaving a mat of silky threads behind.

This damage can be avoided by sorting through all combs and putting all old dark combs aside since most of these will possibly contain stored pollen on which the grubs feed as well as the wax. The remainder should be new or clean frames that have been used for honey storage only. Still segregated, the combs should be stacked at eight to a super five high over a tin tray of a closed floor board and the joins between them sealed with masking tape.

Place a sheet of newspaper on top of this stack in which holes have been made. Sprinkle Paradichlorobenzene (PDB) crystals on this paper and cover the lot with a tight fitting lid. Every three to four weeks check the crystals and renew if they have evaporated. This method is also useful for prottecting combs from damage by mice and rats, and it may be continued with profit until the frames are needed for spring brood rearing.

Beekeepers are born optimists. The coming season is always the one which is going to outdo all previous records for honey production. With your bees coming through the winter in good condition and with plenty of good combs on hand you are more than half way there. The rest is out of your hands because you cannot control weather conditions and related phenomena.

DRONES
The Forgotten Caste

By G. M. Reid Apicultural Advisory Officer Christchurch

The aim of the bee breeder is to produce better or more profitable bees. This may mean more honey per colony or it may mean more efficient pollinators for particular crops. The successful raising and mating of queen bees depends on many factors such as the breeder stock, the age of the grafted larvae, the condition of the starter and finishing colonies and the weather at the time of mating and so on. But, perhaps one of the most important and most overlooked considerations is the presence of an adequate number of sexually mature drones. In this article, and a subsequent one in the next issue of the Journal, I will endeavour to suggest some of the factors regarding drone development and supply that we need to keep in mind if we are to obtain adequately mated queens.

Many beekeepers, through choice or necessity, adhere closely to calendar dates when planning their beekeeping operations. This is the only practical approach for large enterprises but it may lead to the danger of becoming insensitive to prevailing weather or colony conditions. For example, in Canterbury last spring, drone production and maturation was approximately two weeks behind normal. Some beekeepers delayed their grafting cycle accordingly while others did not and suffered heavier queen lisses than usual. Let's have a look at some of the facts about drones and their development, and how to tell when a drone is sexually mature.

DEVELOPMENT STAGES

The drone (from egg to adult) undergoes developmental processes similar to the worker and queen but takes a little longer, viz. 24 days as opposed to 21 days for a worker and 16 days for a queen.

Dzierzon has been credited with the discovery, many years ago, that male bees developed from unfertilized eggs. Drones have a mother but no father and and will inherit all her characteristics so if the queen is black her drones will also be black. This is known as pathenogenesis. It is not peculiar to bees for many other animals have this method of reproduction. The female worker and queen honey bees develop from fertilized eggs. They have both father and mother. From each parent they receive 16 chromosomes and so have 16 pairs of chromosomes. This is the diploid condition. The drone who receives all his inheritance from his mother, has only 16 single chromosomes. This is called the haploid condition and is why drones have been described as "flying gametes".

Recent research has shown that drones can develop from fertilised as well as unfertilised eggs. If queens are inbred for two to three generations by brother-sister matings only about 50% of their eggs will survive. These eggs will be fertilised and laid in workers' cells. By rearing these eggs through to the adult

stage in an incubator, almost all of them will survive in a 50-50 male-female ratio. Further observation in the hive will demonstrate that the workers are somehow able to detect these diploid drones and will canibalise them. The fundamental determiner of sex in bees doesn't depend on the number of chromosomes or whether or not the egg is fertilized. Sex is determined by the action of a series of alleles at one locus, or point, on one pair of chromosomes. This locus is called the X or sex-determined locus.

Drones can also be produced by laying workers or virgin queens that either haven't mated, or are stimulated to lay by anaethetising them with carbon dioxide. Older infertile queens will also produce drones, often in worker cells. Such drones are generally smaller than "normal" drones but still produce viable sperm and are theoretically capable of mating with a virgin. However, in practice such drones are not strong enough fliers to compete with normal drones nor would they have the strength to support the queen during copulation.

Gynandromorph and Mutant Drones

Gynandromorph or hermaphrodite bees are characterised by having both male and female characteristics and are often called bi-sexual. It is not uncommon to find worker bees with drone heads or vice versa. Mutant drones with coloured eyes such as white, green or red may occur, while hair-less drones or diminutive winged forms can also be found. I would be very interested in obtaining any mutant stocks of this nature for shipping to Dr Laidlaw at Davis University in California. These mutant forms are employed in genetic research as well as pollination studies.

Nutrition of drones

Drone larvae grow larger and receive considerably more food during their development than do worker larvae. Haydak (1957) states that the glandular food fed to drone and worker larvae is physiologically equivalent. After the third day of larval life these secretions have honey and pollen added and become a dirty yellow colour. Young adult bees (1-3 days' old) are fed mainly by younger workers with food which resembles modified worker jelly — a mixture of glandular secretions, pollen, honey. In some cases food for the drones is derived from the honey stomach of feeding workers. This type of feeding is followed by a period in which the drones feed themselves on honey from the combs with occasional feeding by older workers. Bees of foraging age, however, will neglect thedrones. The food of flying drones (12-26 days old) consists mostly of honey which they take from cells. Only rarely do they receive it from the workers. Drones do not forage for nectar from the flowers and only occasionally regurgitate food which is taken by the workers.

When is a drone sexually mature?

The time taken to reach sexual maturity depends on the type of food fed and the temperature in the hive, as well as flight activity. For optimum development drones need brood nest temperatures of around 33-34°C and feeding by nurse bees. Drones will also mature better under queenless conditions. Following emergence drones spend most of their time on the comb in the brood nest and solicit food from young nurse bees. They generally remain stationary with only occasional movements of the combs. The majority of drones are sexually mature by 8 days of age and begin their flights about this time. However, they need a

period of physiological maturing during which the muscles of the abdomen and the sex organs strengthen, producing a quick eversion, and ejection of the semen mucus. One authority suggests that the greatest number of drones capable of successfully mating are over twenty days' old. However, at Davis University drones in nursery colonies were found to be satisfactory semen donators from the tenth day following emergence for as long as they lived.

It has been reported that drones whose flight has not been restricted by confinement to the hive, will ejaculate better and in greater numbers after they have beeen kept in a cage for a day or two with workers, sugar syrup, and pollen. The accumulation of faeces seems to increase the pressure inside the abdomen when the muscles contract ensuring a good ejaculation.

There may also be differences in the rate of drone maturation between different races of bees. For example, Anatolian drones reach sexual maturity earlier and ejaculate more readily than do Caucasian drones (Smith, 1971). Therefore, just because drones are present in the hive this doesn't necessarily mean that they are sexually mature or in sufficient numbers to effectively fertilise a large number of queens.

How to recognise the sexually mature drone

The presence of semen on the everted penis is the only reliable indication of the sexual maturity of a drone. Drones can be made to evert the penis by subjecting them to concentrated vapours of chloroform or ethyl acetate. The best procedure for a beekeeper, however, is to capture drones from the entrance or outside combs. Drones from these locations are likely to be older and more mature than else where. Pinch in the head then gently squeeze the thoracic end of the abdomen until the penis partially everts as in Fig. I. Faeces may also appear at this stage. Further gentle pressure on the abdomen should cause complete eversion of the penis as in Fig II. The older the drone the more easily the penis everts after this second pressure. A really mature drone may evert completely with just a slight pressure on the abdomen. In all cases white mucus, which is thick and has the consistency of cream, lies at the tip of the bulb. This mucus coagulates rapidly in the air. If the drone is sexually mature cream

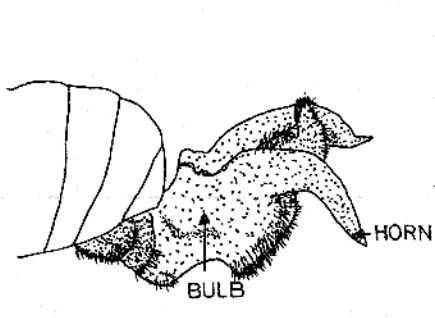


FIG I

Partial eversion of a drone honey bee's penis

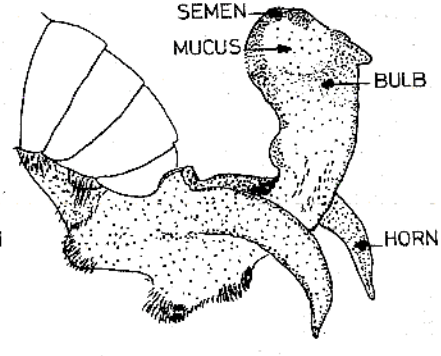


FIG II

Complete eversion of a drone honey bee's penis with semen and mucus exposed.

coloured semen will be found generally lying on top of the white mucus. This semen is fairly liquid and may spread rapidly over the mucus.

How long does a drone live?

Washington (1967), summarising the work of various researchers, reported that the average length of the life of adult drones in the summer was 23.5 days in one study and 54 days in another. Maximum longevity was 59 days. The average life span can be increased by maintaining drones in a nursery colony and also during winter months in a queenless colony. One researcher who experimented with 30 marked drones, found that they took an average of about an hour and a half to die following eversion during mating.

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Executive Meeting at WELLINGTON IN MARCH

A meeting of the Executive was held in Wellington on 12th, 13th and 14th March, 1973. Those present were Mr I. J. Dickinson, President (in the chair); Messrs J. Bray, M. Cloake, D. Penrose, E. Whalley. In attendance: Messrs E. R. Neal (Association Secretary and N. S. Stanton (Editor of N.Z. Beekeeper).

DRAFT OF AMENDED H.M.A. REGULATIONS

The President said that there would be a meeting at the Ministry in Wellington during the period that the Executive were in Wellington at which Messrs Poole and Eckroyd would represent the Honey Marketing Authority and the President, the Secretary of the National Beekeepers' Association and one member of the Executive would represent the National Beekeepers' Association and Mr E. Lee would represent the Ministry.

OBITUARY:

The President said that he regretted to report the death of Mr W. W. Nelson. Members stood for one minute in memory of the late Mr Nelson.

MINUTES OF PREVIOUS MEETING:

Minutes of the meeting held on 5th December 1972 were considered. It was agreed that on page 7 the words "packing firms" should become "packers".

On the motion of Mr Whalley seconded Mr Cloake it was **resolved** that subject to the above correction to the Minutes, these Minutes which had been previously circulated to members be confirmed as being a true and correct record of the proceedings.

MATTERS ARISING OUT OF MINUTES:

(a) **Noxious Weeds:** Mr Cloake reported that this matter was in progress and that he would be able to report to the next meeting. Mr Dickinson said there had been a meeting regarding noxious weeds held in Timaru in February.

(b) **Packers Association:** Mr Penrose said that a meeting had been held in Christchurch and he had gone along prepared to negotiate. He said he was unable to achieve any basis for a negotiation at that stage.

Mr Haines and Mr Bray who are other members of the delegation endorsed Mr Penrose's report. It seemed that the area of difficulty was the representation wanted by the Packers. They wanted two members as of right on the N.B.A. Executive. Mr Bray said he felt that if the N.B.A. could give some sort of lead, the Packers Association would go out of existence. Mr Dickinson read a letter from the President of the Packers Association in this connection.

BRANCH BALANCES:

The Secretary reported that some branches had not sent in the second instalment of their branch balances.

On the motion of Mr Cloake seconded Mr Whalley it was **resolved** that reminders be sent out to those branches who had not remitted the second half of their 30th April 1972 balances, excluding Nelson Branch.

PRESIDENTIAL LETTER TO THE HONEY MARKETING AUTHORITY:

On the motion of Mr Whalley seconded Mr Bray it was **resolved** that Mr Dickinson's letter of 18th January 1973 to the Honey Marketing Authority which was subsequently published in the February "N.Z. Beekeeper" be confirmed and endorsed.

COMB HONEY ASSOCIATION:

A letter had been received that morning from the Comb Honey Association. It was agreed that the letter be received and replied to after a consideration of the draft regulations.

N.Z. BEEKEEPER:

Mr Stanton said it was his intention, if Executive so approved, to send to registered beekeepers who were not subscribers or members of the Association a gratuitous copy of the May "Beekeeper". On the motion of Mr Penrose

seconded Mr Bray it was **resolved** that the Executive authorise the Editor to print approximately 1,000 extra of the May issue of the "New Zealand Beekeeper" and that these be distributed to non-members of the Association together with an explanatory leaflet.

PAYMENT FOR CONTRIBUTIONS TO THE N.Z. BEEKEPER:

On the motion of Mr Penrose seconded Mr Bray it was **resolved** that suitable contribution from Beekeepers to the "N.Z. Beekeeper" be paid for at nominal fees.

FORMAT AND CONTENT OF THE N.Z. BEEKEEPER:

The present Editor sought opinions of members as to the format and content of the "New Zealand Beekeeper".

On the motion of Mr Dickinson seconded Mr Penrose it was **resolved** that the Editor be complimented on his first two issues of the **New Zealand Beekeeper** and that he be asked not to make any changes.

CONFERENCE 1973:

On the motion of Mr Whalley seconded Mr Bray it was **resolved** that the Conference be held on the 11th, 12th and 13th July 1973, subject to Nelson Branch's approval as to dates, and that if there was any local difficulty with these dates a second choice of dates be the 4th, 5th and 6th July.

NOTES FOR RUNNING CONFERENCES:

Mr Penrose congratulated Mr Haines on the notes he had drawn up for the guidance of those branches running conferences and which had already been supplied to Nelson Branch. It was agreed that the Secretary write to Nelson Branch reminding them to supply details of the conference arrangements for the May issue of the "New Zealand Beekeeper".

It was agreed that the business session of conference be from 10.00 a.m. on the Wednesday to 1.00 p.m. on the Friday and these times be strictly adhered to. It was agreed that insofar as delegates' votes were concerned, pre-printed forms be prepared by the Secretary.

EXECUTIVE MEETING PRIOR TO CONFERENCE:

Notes were taken by the Secretary of members' wives who would be attending and the mode of transport Executive would be using. It was agreed that the Executive Meeting start at 2.00 p.m. on the Monday preceding Conference. The President said that in view of the start at 2.00 p.m. on the Monday, there would be exactly a day and a half in which to transact business because, in his opinion, it was very ill-advised to meet at night with the heavy work of a conference coming up. He therefore urged members to get matters in for the pre-conference Executive Meeting Agenda to the Secretary as soon as possible.

TINS EX ALEX HARVEY:

Mr Dickinson said he had received a communication from a Mr Marsh expressing concern at delivery of tins without lids being affixed. Mr Penrose suggested that there should be an article in the Journal advising members that they should specify that lids be put on tins before delivery.

HIVES NEAR ROADSIDES:

Mr Haines said that there had been particular problems in his area. There were numerous complaints in respect of hives being near roadsides and children were getting stung. The local Council had asked the beekeeper to shift them and the Council had said that they would not shift them themselves. This was referred back to Mr Haines to take up with his local branch.

TOUR OF CANADA:

Mr Haines said there was a projectetd tour of Canada for beekeepers in winter 1974.

On the motion of Mr Penrose seconded Mr Whalley it was **resolved** that Mr Haines be appointed as a sub-committee of one to bring down a report to the Executive meeting prior to Conference on a suggested tour of Canada.

BURSARY:

Mr Haines said with a tour of Canada a possibility he wondered whether there should be a surcharge or members to build up a bursary fund plus a free ticket.

FUNDING OF BURSARY:

On the motion of Mr Cloake, seconded Mr Haines, it was **resolved** that the $250 in the Bursary Fund be funded.

DESTRUCTION OF WASPS:

It was agreed that the Editor write to Mr Glasson on the West Coast re a wasp trap that the latter had made, for publicaion in the Journal.

METRIC MEASUREMENTS:

Mr Dickinson said that he had discussed this with the General Manager of the H.M.A. It appeared that the deadline was 1976 for the changeover, which gave some time for re-adjustment.

On the motion of Mr Dickinson seconded Mr Whalley it was **resolved** that the letter from the Honey Packers regarding metric measurement be received and they be advised that this was in accordance with the wishes of Executive, except that quantity measurements should be converted to weight measurements.

STATE ADVANCES LOANS:

It was thought that the limit was still $10,000 and perhaps this should be raised.

On the motion of Mr Haines it was **resolved** that the Secretary ask State Advances whether there was any limit applying to State Advances loans to beekeepers, or whether each case was judged on its merits.

SPRAYING OF CLOVER UNDER FRUIT TREES:

Mr Bray reported that a queen breeder had lost all of his queen nuclei bees after spraying of fruit trees in late December. He wondered whether there was any repellent that could be put in with the spray. Referred to Mr Smellie.

CONFERENCE SPEAKER:

The question of who would open the Conference was canvassed. On the motion of Mr Bray seconded Mr Penrose it was **resolved** that a Minister of the Crown be approached with the following preferences being observed in case Ministers were unable to attend — i.e., Messrs Moyle, Freer, Walding.

PEOPLE TO WELCOME DELEGATES TO CONFERENCE:

It was thought that the Mayor and Mayoress of Nelson would welcome delegates, and it was agreed that Mr Penrose make arrangements re this. On the motion of Mr Dickinson seconded Mr Whalley it was **resolved** that Mr Penrose be appointed a sub-committee of one to liaise with Nelson Branch re all aspects of the Conference.

CARRIAGE OF BEES BY AIR:

Mr Haines reported that he had been to N.A.C. during a break in the proceedings. It was agreed that the Secretary write to Mr J. C. Fergusson, the Freight Services Manager, advising that the Executive had approved the devices on packaging as per photographs handed to him by Mr Haines and in respect of N.A.C.'s letter of 29 December, 1972.

At this stage, Mr Dickinson withdrew from the meeting to confer with Mr Poole.

It was agreed that this matter lie on the table.

MISLEADING ADVERTISING:

It was reported that "Soil" magazine had carried an advertisement advertising creamed honey that contained no glucose or icing sugar. On the motion of Mr Bray seconded Mr Whalley it was **resolved** that the Editor write a letter to the Editor of "Soil and Health" magazine pointing out the implications of the advertisement in question. Mr Hains moved that a letter be written to the "New Zealand Herald" regarding an advertisement which contained the words "absolute purity". This lapsed for want of a seconder.

SEMINAR FINANCES:

Mr Cloake reported that he had handed $180 to the Secretary which represented the profit from the Timaru Seminar less $10 which had been kept against contingencies. There had also been a cheque stopped by a person who did not attend the Seminar.

On the motion of Mr Cloake seconded Mr Bray it was **resolved** that the Seminar fund be funded.

On the motion of Mr Bray seconded Mr Cloake it was **resolved** that the Seminar and Bursary accounts be funded on fixed deposit at the Bank of N.S.W. and that the signing authorities be as per the No. 1 Account.

SEMINAR:

Mr Cloake said he had endeavoured to have as much of the Seminar proceedings and papers published in the "New Zealand Beekeeper" as possible. However, he thought that Graeme Walton's address at the 1972 Seminar should be sent out to members.

DEPARTMENTAL:

At 2.30 p.m. Mr Smaellie arrived and offered apologies for Mr Watt.

The following was discussed:

1 Grading at Southland Depot: the N.B.A. thought that this was in arrears. Mr Smaellie said that Mr Cook was caretaking at the Southland Depot for urgent work. Whilst it seemed that some of the work had fallen into arrears, the situation was now under control.

2 Noxious Weeds: Mr Smaellie said he knew very little about this except that it was in the melting pot. A Mr Hadfield of the Department was on the Noxious Weeds Committee, whose purpose it was, Mr Smaellie understood, to generally tidy up the legislation. It was agreed that the Secretary write to Mr Hadfield of the Advisory Services Committee.

3 Future Organisation of Seminars: Mr Dickinson said the N.B.A. was contemplating a Seminar in the North Island in 1974.

4 The Agricultural Advisory Officer at Christchurch: Mr Bray said he understood that the present officer had been there for six months and he wondered what procedure was necessary to requisition work on that officer. Mr Smaellie said that the officer had a work programme which was formulated 12 months ahead. Beekeepers or the N.B.A. requiring work to be done should approach the officer concerned.

5 Honey House Regulations: Mr Smaellie said that he had already rung the Health Department to check on the progress of the legislation. A Mr Cook at the Health Department had said that they had the Regulaions with the Law Draughtsman. In the meantime, the Department of Agriculture was carrying on the policy of the honey houses.

6 Destruction of Wasps: Mr Smaellie said that there had been no more progress except that they were still working on baits. There still seemed to be no better methods. Mr Dickinson wondered why the Department could

not take the responsibility of destroying wasps. Mr Smaellie said that the Department accepted the responsibility for giving advice but would not carry out the destruction.

7 Importation of Queen Bees from Tonga: Mr Smaellie said the importation could not be accepted by the Department as it was too risky. They could not recognize Mr Walsh's report as an "in-depth" investigation. They had found a mite about which nothing was known on queen bees at Tonga. It was ust big enough to see with the naked eye. Mr Smaellie said it was the Department's opinion that two or three mites to a bee would make the bee very sick. He also said the Bird Life and Horticultural people were not prepared to allow the importation because they did not think there was enough economical importance to justify the expense.

8 Extra copies of "New Zealand Beekeeper": Mr Smaellie was invited to send a list of the extra copies of the "Beekeeper" needed by departmental officers.

9 Features for the "New Zealand Beekeeper" ex departmental officers: Mr Smaellie said that this seemed to find its own level in regard to contributions. He always encouraged officers to write articles.

10 "Beekeeping in New Zealand": Mr Smaellie said he was most frustrated that this was out of print. It was at present at the Government Printer but he wondered whether priority may have slipped in relation to other legislation and work. Mr Penrose said he thought some of the plates could be brought up-to-date. Mr Smaellie said they could not do much with the original material. He had initiated arrangements whereby a completely new bulletin would eventually be produced.

11 Repellents with Sprays: Mr Smaellie said there was no satisfactory solution to date. The Department, through Mr Palmer Jones, had the problem steadily in front of them.

12 Conference papers: Mr Dickenson said that all departmental conference papers should be received by the N.B.A. well in advance of the Conference so that these could be printed and distributed.

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13 Honey Dew Regulations: Mr Smaellie said he was working on this assiduously. The regulations were to control the quality of exports. One set of regulations for honey and another for honey dew could not be entertained.

RULES:

Conference asked that the Berry/Belin resolution re delegates' votes recording majority and minority votes be implemented. On the motion of Mr Dickinson seconded Mr Penrose it was resolved that the rule read:

"28 (ee) On a poll each delegate shall have one vote for each full dollar of annual subscription of financial members actually present at the Branch Meeting empowering the delegate and that both majority and minority votes be recorded in the delegates' votes at Conference."

Executive REMITS:

ON THE motion of Mr Dickinson seconded Mr Haines it was resolved that Remit 31 by the Executive from the 1972 Remit Paper re Rule 9a be fully presented as a remit in 1973.

On the motion of Mr Penrose, seconded Mr Whalley, it was resolved that Executives prepare a remit for the next Conference that Rule 30 be altered to delete "one vote only" and substitute "one vote for each full dollar of annual subscription actually paid by him in the preceding financial year."

On the motion of Mr Cloake seconded Mr Haines it was resolved that Executive prepare a notice of motion for presentation at the 1973 Annual General Meeting that all subscriptions be subject to a sur-charge of $2 per annum throughout the whole scale effective as soon as possible under the rules.

On the motion of Mr Penrose seconded Mr Whalley it was resolved that a sub-committee of the Executive be set up with power to co-opt members to deal with all matters pertaining to packing honey.

On the motion of Mr Penrose seconded Mr Bray it was resolved that a sub-committtee of the Executive be set up with power to co-opt members to deal with all matters pertaining to queen breeders.

ANNUAL REPORT:

The Secretary was asked to prepare a short report under the rules.

QUEEN BREEDERS SUB-COMMITTEE:

On the motion of Mr Penrose seconded Mr Whalley it was resolved that Mr Haines be Convenor of the Queen Breeders Sub-Committee.

PACKERS SUB-COMMITTEE:

On the motion of Mr Bray seconded Mr Penrose it was resolved that Mr Whalley be the Convenor of the Packers Sub-Committee.

ALTERNATIVE SCHEME (COMMONLY KNOWN AS ECROYD SCHEME):

Mr Cloake felt it was pointless to discuss this because of the Government's attitude. Mr Dickinson moved and Mr Cloake seconded a motion that no further action be taken on the alternative (Ecroyd Scheme). Mr Whalley moved and Mr Bray seconded an amendment that the word "further" be replaced by the word "immediate". When the amendment was put it was carried and the substantive motion when put was carried.

POSTAL BALLOT:

On the motion of Mr Bray seconded Mr Cloake it was resolved that Waikato Branch's resolution re a postal ballot not be proceeded with in view of Conference decision re the levy.

WAIKATO BRANCH:

It was noted that Waikato Branch were sending resolutions to the Honey solved that all branches be reminded that all correspondence on matters of Marketing Authority. On the motion of Mr Bray seconded Mr Walley it was re-national interest be referred to the National Executive for examination and action.

HONEY MEAD:

Mr Penrose and Mr Bartrum some time ago had been to see the Department of Justice. It was agreed that the Secretary write to the new Minister of Justice to try to get some urgency.

SUB-COMMITTEESS ON PACKERS & QUEEN BREEDERS:

On the motion of Mr Penrose seconded Mr Bray it was resolved that an amount not exceeding $25 each be granted to the sub-conveners of the Packers Sub-Committee and the Queen Breeders Sub-Committee.

PRESIDENCY:

Mr Bray moved and Mr Penrose seconded a motion that Mr Dickinson be nominated for the office of President at the 1973 Annual General Meeting.

At this stage, Mr Dickinson vacated the Chair and the Secretary assumed it. When the motion was put it was carried unanimously.

DONATIONS RECEIVED

The following donations have been received from individuals and companies:

R. W. McFadden, P. C. Muir, J. W. Etherington, Ecroyd & Son Ltd., H. McKenzie, A. W. McKenzie, W. H. Adamson, P. R. Robins, A. C. W. Murray, L. W. Claridge, D. J. Bayer, R. G. Hall, P. J. Pearson, M. E. Hearne, T. Wilton, W. A. Winter, E. J. Whalley, Glassons Apiaries, G. H. Halland T. D. Rawe, R. W. Pearce, Anonymous—Hokitika, P. M. Larkshear, G. A. Lee, Neil Roamey, W. G. Richards, A. Dickie, L. Lloyd, A. H. Bowyer, Ray Paterson, M. D. Cloake, Dudley Larimer, D. G. Wright, C. T. Stone, J. G. Russell, D. F. Penrose, S. A. Nicholl, H. P. Perrin, D. G. Cuff, Bray & Gassett Ltd, D. G. Ffiske, T. Burns, L. J. Bradfield, Miss A. Leech, R. J. Dickinson, J. C. Ketel, P. Vener, Hugh Craig, G T. Pawson, D. B. Steedman, W. A. Lindsay, W. A. Bustand, W. J. Partington, J. W. & H. B. Donaldson, M. J. Heinemen, A. J. Tucker, K. R. Hay, Fred Wech, R. K. Kilgram, Mahoe Apiaries Ltd, Palmer Apiaries Ltd, Acacia Bay Apiaries, Alan Bates, M. D. Haines, Terry Gavin. A total cf $742.80.

The following Branches have made contributions: Northland, Auckland, Waikato, Bay of Plenty, Hawke's Bay, C/S Hawke's Bay, S.W. Districts, Nelson, Westcoast, Canterbury, South Canterbury, North Otago, Otago, Southland. A total of $1121.27.

How Do Honey-bees Become Infected? A review of recent research

G. M. WALTON, Apicultural Advisory Officer, Palmerston North.

The protozoan intestinal parasite of the honeybee, *Nosema apis,* is common to all continents of the world. Peak infection generally occurs during the late winter and spring months with a rapid decline in the summer. Outbreaks of nosema disease have had debilitating effects on colonies; by shortening the life of the queen and worker bee, reducing brood production ,causing queen supersedure, and decreasing the production of honey. However such outbreaks are rare. Natural infection seldom has any damaging effect on colonies.

In recent years literature on the topic of nosema has presented different explanations as to the method of infection and as to the cause of the seasonal fluctuations. The somewhat traditional belief is that bees become infected as a result of the ingestion of spore-contaminated honey, nectar, pollen and water. The spores, originally from the faeces of infected bees, are distributed quickly during the food transmission process within the colony. This hypothesis that nosema infection spreads via food and water was strengthened by the claim of one research worker that spores accumulate in the hypopharyngeal (or brood food) glands. If this was the case the secretion from these glands would be a major source of infection. However many other researchers have not supported the claim that the hypopharyngeal glands can harbour nosema spores. The weight of scientific evidence indicates that only the midgut epithelium becomes infected with nosema.

The reduced level of natural infection in the summer months has been attributed to the inactivating effect of temperatures in excess of 35°C on nosema. In the south western United States nosema was less of a problem than in the southeast and it has been suggested that the exposure of bees and/or equipment to relatively high temperatures may be a cause of the lower infection levls. But this cannot be the only explanation. There are many countries in the world where the summer temperatures seldom climb above 30°C and yet infection rates decrease during the summer.

Dr L. Bailey, of Rothamsted Experimental Station in England, has for a number of years studied the transmission of nosema disease. He has concluded that the cleaning of infected comb, rather than the contamination of food and water, is the major vehicle for the transfer of nosema. Bees normally defaecate outside the hive while in flight but during periods of long confinement bees may void within the colony. T his is more likely to occur in the winter-spring period than at any other time. Other bees become infected when they clean up the infected matter.

Assuming that infected bees do not contaminate food and water they gather, Dr Bailey reasoned that infection levels would then decrease spontaneously because nosema would not be transmitted by the succeeding generations of spring and summer bees. Dr Bailey has provided weighty evidence to support his hypothesis. Colonies transferred to disinfected empty combs in early summer either lost their infection or it was reduced below the levels of untreated colonies, despite the fact that the original honey was still available to the bees (Bailey, 1955). In a recent article titled "*Nosema apis* in drone honeybees" in the Journal of Apiculture Research Dr Bailey (1972) has provided further information that indicates that nosema infection is not transmitted primarily in food and water. He found that although drones were just as susceptible as workers to infection a much smaller proportion of drones than of workers became infected in nature. Although a few spores may get into food, and thus lead to infection, Dr Bailey believes that the mouth-parts of comb-cleaning workers are a more likely source of spores for drones. Drones do not partake in any comb-cleaning tasks and it is only during the early days of life that drones are fed by workers. It is young workers 4-6 days old that most frequently feed the drones and this coincides with the age that worker bees undertake comb-cleaning.

Earlier work by Dr Bailey (1968) has shown that although queen honeybees are quite susceptible to nosema infection they are rarely infected in nature. This low incidence could again be explained in terms of behaviour: queens do not clean combs and are fed by workers generally in the 6-13 days old category who have mostly ended their cell-cleaning duties.

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Field Day With a Difference

LINCOLN COLLEGE, MARCH 2 1973

This Field Day was organised by the Ministry of Agriculture and Fisheries and chaired by the local Apiary Instructor, John Smith. About fifty Commercial Beekeepers, their wives and staff, plus departmental personnel attended throughout the day.

The theme of the morning's session was **"Farming in Canterbury into the 1980's"**. Mr A. P. Ryan, the Chief Meteorologist in Christchurch opened the programme by discussing the complexities of weather forcasting in New Zealand, then described the weather patterns, past and present, of the plains. It seems from from the records that there are no real changes in Canterbury weather. Further, they can't explain any small difference observed. For example, there was 25% more rainfall on an average, between 1920 and 1952, than since that period but no one knows why. Mr Ryan also delved briefly into weather folklore; bees, for example, probably sense approaching thunderstorms by monitoring changes in the atmospheric relative humidity. A fall in temperature and a rapid rise in RH always precedes a thunderstorm.

Mr D. Watson, who was a 1971 Nuffield Scholar, and is now farming on a mixed farm in the Weedons area, gave his views on what changes were going to occur in the farming industry. Mr Watson saw the Canterbury Plains as an intensively irrigated area specialising in producing forage and seed crops and horticultural crops for processing. Mr Watson also had some rather pessimistic views on the subdivision of farm lands. He saw the advent of numerous 10-acre farms growing crops on contract and whose occupants were reduced to little more than peasant status. He called these M.D.K. farms, that is mum, dad and the kids!

Mr Peter Smale, a Horticultural Advisory Officer, envisaged the plains becoming the **"Food Bowl of the South Pacific"**. Extensive irrigation schemes would be coupled with an intensification of farming practices. Canterbury would continue to produce grain, cereal, seed crops but the main expansion would be into horticulture, particularly berry fruits and vegetables for processing. Sheep would be grazed only on the high country and would be fed waste herbage from summer crops and the processing factories. The beekeeper would have a vital and specialised role to play in extensive pollination programmes.

Murray Reid, Apicultural Advisory Officer, discussed some of the changes that will occur in the beekeeping industry with respect to bee breeding, hive construction and management. Also the development of new crops either requiring specialised pollination services or planted and manipulated specifically for nectar and pollen production. His talk is published following this report.

Mr Harvey Smith, Director of the D.S.I.R. Crop Research team at Lincoln, began the afternoon session by describing the role of his section and some of their current research projects. Mr Tom Jessop, Technical Officer, Entomology, gave an interesting talk on his work in biological control of aphids. He is concerned with finding a practical alternative to insecticides and to this end has been importing, breeding and establishing various species of ladybirds and lacewings. If integrated systems of insect pest control, involving natural predators and selective insecticides, could be perfected and adopted by the whole farming industry, then mass mortality of bees through poisoning would be a thing of the past.

Dr Barry Donovan, an entomologist with the D.S.I.R., gave an insight into the possibilities and problems of using other bee species such as the leafcutter and alkali bees, for pollination of lucerne. Dr Donovan illustrated his talk with

some excellent colour slide micrographs of the bees he has been importing and examining under quarantine, before releasing in the field. The necessity of releasing only parasite-free bees was illustrated very graphically.

The day concluded with a visit to some of the leafcutter bee sites at the D.S.I.R. Beekeepers were given the opportunity to examine tripping in a special lucerne seed plot as well as the activities of the bees in their drinking straw domiciles. An experimental plot of peppermint, which was extremely attractive to honey bees, was also examined with interest by the participants in the field day.

MURRAY REID (Apicultural Advisory Officer)

METRIC SPECIFICATIONS FOR BEEKEEPING EQUIPMENT

New Zealand is presently in the process of changing over to the metric system of measurement. The Metric Advisory Board has set 1976 as the date for substantial conversion of measures to the metric system. January 1975 will see the commencement of timber cut to metric dimensions. The Ministry of Agriculture and Fisheries is currently examining the specifications for all beekeeping equipment and it is planned to have the new metric recommendations available in time for the change in timber sizes.

An introductory study paper titled "Background to Metrication of Beekeeping Equipment" examines the existing recommendations, prepared by the former Department of Agriculture, in the light of present day and the future industry requirements. This study paper is of particular interest to beekeepers who manufacture their own equipment, but is available to all without charge from the Ministry of Agriculture and Fisheries, Private Bag, Palmerston North. Beekeepers are invited to submit their own suggestions, criticisms etc. with respect to this study paper.

Apicultural Development into the 1980's (cont. from page 27)

Those beekeepers who don't "go to the bush" will become beefarmers in the fullest sense of the word. They will plant and harvest such crops as rape, sweet and white clover, lucerne, buckwheat, peppermint and other herbs, sainfoin and **Phaecellia.** These crops will yield nectar, pollen, seed, and perhaps green fodder. Beekeepers will also be utilising permanent stands of trees or bushes such as **Robinia, Vitex,** eucalypts and so on. Different varieties of these trees will be planted to give a continium of nectar and pollen production. However, nectar secretion will be enhanced by spraying or irrigating these stands with growth regulating hormones and mineral solutions, such as potassium, that stimulates nectar secretion.

Many of the innovations and changes that I have suggested will occur in our industry may not appear until the next generation of beekeepers. However, we shouldn't need an economic recession or habitual crop failures to make us reexamine our location, our management techniques, or our equipment. Many of the innovations I have talked about are still on the drawing board or in the hands of the "pure scientist" and won't be available to the industry for several years. However, we need to reconsider our role in the pollination of horticultural crops right now.

The Christchurch area alone could probably support one fulltime beekeeper supplying hives for pollination only. The rest of the farming world in Canterbury is rapidly changing and becoming more specialised and intensive and we can't afford not to be a part of the cchange.

Vacuum Collecting of Bees in Polystyrene Queen Cages

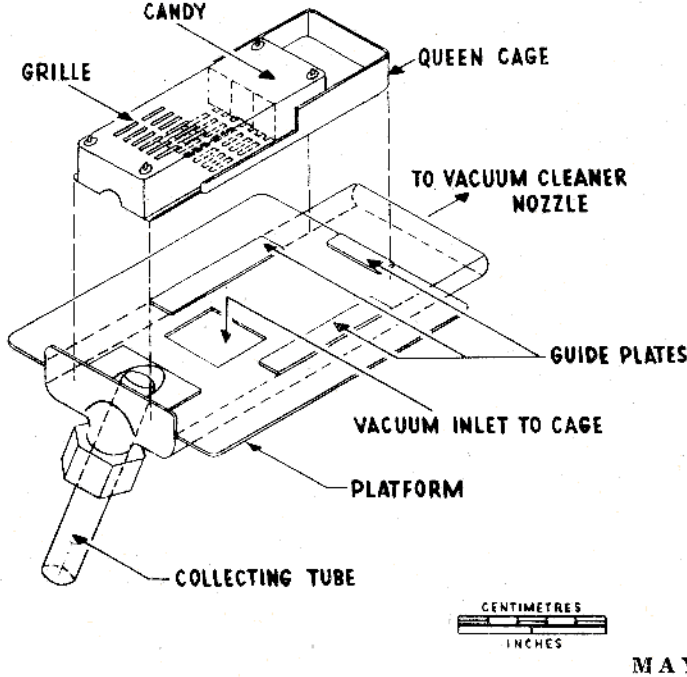
By P. G. Clinch Wallaceville Animal Research Centre, Ministry of Agriculture and Fisheries, Upper Hutt.

SUMMARY

A battery-operated vacuum device to collect honey bees in polystyrene queen cages.

INTRODUCTION

A device for collecting honey bees in queen cages, using a modified car vacuum cleaner, has been described by Clinch (1970). This was designed primarily for collecting bees in 6-hole wooden cages. With the advent of a flourishing export market in queen bees, Mr J. Bray, of Bray and Gosset Ltd., Leeston, Canterbury, developed a polystyrene cage (Fig.1) which has been used very successfully for this trade and also for transporting queens within New Zealand. Designed for hand-loading with bees, the cage has a sliding lid and, unlike the wooden ones, has no entry hole in the end of the bee compartment. Thus, when using these cages with a vacuum collector, bees have to be sucked through the aperture made by slightly opening the sliding lid. This is a difficult and slow procedure when carried out with the original design of adaptor. To overcome this problem, a new model has been designed specifically for use with these polystyrene cages.



DESCRIPTION

The adaptor (Fig. 1) has been designed to fit the "Car-Vac" car vacuum cleaner, which operates either from a 12 volt car battery, or from heavy duty cells (two Union Carbide No. 731 or a similar type). To increase the air flow, the cloth filter in the cleaner was removed and a piece of wire gauze glued in its place to protect the impeller. The adaptor should also function satisfactorily with other vacuum cleaners with different nozzle sizes after modification.

The main components of the adaptor were cut from sheet metal and soldered together. To avoid air leaks the raised area around the top of the collecting tube must be 1.6 mm (1/16th inch) above the platform. In the prototype, 18 gauge cadium-plated mild steel was used to construct the platform, guides, etc., and 24 gauge galvanised iron, which can be more easily bent, was employed for the section that fits into the vacuum cleaner nozzle. However, the thickness of the metal is not critical. Approximate dimensions can be obtained from Fig. 1. The collecting tube (9.5 mm (3/8 inch) internal diameter) was made of glass mounted in rubber, but a metal tube may be satisfactory. The tube was mounted at an angle of 45° to the platform. It is important that this angle is not exceeded.

The device is operated as follows. A queen cage, previously charged with candy, is placed upside-down on the platform with the lid between the guides. The cage is then opened by sliding the base over the collecting tube. The vacuum cleaner is turned on, and when a finger is placed over the grille in the bottom of the cage, bees can be sucked up through the collecting tube. The vacuum level can be reduced by covering less of the grille. It is most important that only a moderate vacuum is used or the bees may strike the cage with sufficient force to suffer injury. When the required number of bees has been collected, the cage is closed by sliding the base over the lid, after which it can be removed from the device.

Experience has shown that, provided the vacuum is adjusted correctly, escort bees can be quickly collected without injury. Care should be taken to avoid overloading cages. Experiments carried out at Wallaceville show that overheating can occur in warm weather if too many escourts are used. We therefore recommend that each polystyrene cage contains no more than seven escorts.

The apparatus is unsuitable for diagnostic work, because the collecting tube would require cleaning between samples to prevent cross-contamination. Furthermore, individual cages will not hold the 30 bees required for diagnosis.

ACKNOWLEDGEMENTS

The author wishes to acknowledge the help of the following members of the Wallaceville staff. Mr T. Palmer-Jones who gave encouragement throughout the development work; and Messrs J. Bellamy and A. W. Barkus, who prepared the diagram.

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Beekeepers' Technical Library

The Library of the National Beekeepers Association of N.Z. Incorporated. Honorary Librarian, Chris. Dawson, P.O. Box 423, Timaru.

There is an extensive collection of books and magazines which are available to members of the Association. This is a very wide selection which covers most of the modern books on commercial and domestic beekeeping.

Catalogue and list of Rules available from the Librarian.

BOOK REVIEW

BEEKEEPING—By Lt.-Col. A. Norman Schofield in the "Teach Yourself Books" series. A complete guide to Apiarism, N.Z. price $1.40.

I did not read more than the first half of this book because it is so full of misleading information and outright mistakes that I felt my time was being wasted. But I must caution anyone who has this book to be careful about taking it literally. Better seek a reliable book from the "Beekeepers Technical Library".

Beekeeping Project For Papua New Guinea

By Chris. Dawson, Honorary Librarian

Although most of the three months I was absent were spent helping to erect the buildings of the Kwinkia Bible School in the Western Highlands, my interest in beekeeping caused me to become involved in other ways.

I wrote to each of the few beekeepers within about two hundred miles and to one at the coast three hundred miles away. Their reactions were surprising.

One man replied immediately that he was most anxious to meet me to talk about bees, and also that he was planning to emigrate to New Zealand later in the year.

Another beekeeper, a teacher of agriculture in a Southern Highlands secondary school, asked if it would be possible to undertake the six-hour drive over rough roads, talk bees, stay the night and drive home the next day.

From the Eastern Highlands came an urgent request from a secondary school master to visit and stay, and from the coast a request to "call, please."

What strange people — all this just to talk about bees. I visited them all.

Some of these discussions often went far into the night. I concluded that a tremendous contribution could be made to the lives of this native people if they were introduced to beekeeping at village level.

Sleepless nights were spent turning the problem over in my mind until a plan gradually evolved.

At the Christian Leaders' Training College an interview was granted with the principal, the registrar, and the manager of the model village where a plan was outlined for the introduction of a pilot scheme to teach beekeepin gat the college.

Situated at Banz near the centre of the highlands, I considered it strategically placed and with good facilities to make the scheme succeed.

No equipment is available in Papua New Guinea and very little funds were available to promote the project at that date.

My plan was to transport enough equipment from New Zealand or Australia to establish twenty hives plus the associated sundry equipment. With this available an dsome expert tuition, many of the students could, with training gain the confidence necessary to handle bees and with this skill supplement their diet and their income.

Funds will be needed and I am sure there are people who would like to help the project.

Any person who would like more information or would like to help is invited to write to— Papua New Guinea Beekeeping Project, C/- P.O. Box 354, Timaru.

An understanding of the behaviour provoked by alarm pheromones is therefore, useful to the beekeeper. On days when nectar is abundant, there are fewer guard bees in the hive and the entire colony is less inclined to sting. During a good honey flow a beekeeper may work many colonies without being stung. Most of the house bees remain on the frames. Few, if any, bees are flying up against the beekeeper's veil. One of the reasons for this relatively tranquil behavior is that the foragers, with their supply of alarm pheromones, are away from the hive. But on cold and rainy days, or when the nectar flow is limited, most of the foragers are in the hive; these bees, supplied with the alarm chemicals, are ready to defend their colony.

Smoking bees has been a common practice since antiquity. When a hive is smoked the bees engorge. Furthermore, the smoke serves to mask the alarm chemicals(8,9). The use of smoke thus makes hive manipulation possible on more days of the year rather than on just those warm, windless, sunny days usually characterized by an abundant nectar flow. After applying the smoke the beekeeper may encounter several bees who, despite the smoke, get the chemical message and sting. By removing the stinger and applying more smoke, the beekeeper unmasks himself and reduces the possibility of further stings by masking the alarm pheromones.

If the beekeeper must go to the apiary when less than ideal conditions prevail and suffer the consequence, he will at least know one of the reasons why his bees seemed so unfriendly.

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Flowers for Bees

Mr Dines in his October article "For Beginners" refers to the Ivy blossom being valuable for feeding brood at this time of the year. I have kept a record of flowers liked by bees and will try and supplement his information. Just now the garden seems to be more full of bees than at any other time and the principle attractions in my garden are Golden Rod (Solidago), Michaelmas Daisies, and a purple Sedum.

There is also a fragrant shrub, Caryopteris clandonensis, which I saw covered with bees in September 1970, at the experimental Horticultural Station. I raised

3 plants from seed and planted them in thre different places and hardly a bee visits them. I think one must mass one's bee flowers to get results. Similarly, I bought 2 Salvias (S. superba, blue) and 2 Eryngiums (E. tripartitum) from Great Dixter (Northiam) where I had seen them full of bees. Again my bees hardly look at them.

It seems that with all bee flowers there are times and seasons when bees don't visit them. Perhaps the use of Chanel No. 4, as reported in Bee Craft p. 48, is necessary!

Spring is the other season when garden flowers are sought after. The earliest are Crocuses, Snowdrops, winter Aconites and Willows, (Pussy Willow and Salix Cardinalis). There are two kinds of Crocuses, the species Crocus and the ordinary Crocus, of which the yellow is said to be the better for nectar. In April and May, the common Aubretia and yellow Alyssum (A. saxatile) and Wallflowers are good, so also is the Dandelion. It should not be counted as a weed. Then there are the fruit trees, and strawberries, gooseberries, and currants, including the flowering currant.

In summer the varieties of flowers are too numerous to detail. I would advise anyone interested to get F. N. Howes' "Plants and Beekeeping" for much valuable information. I would only mention Catmint (Nepeta) and the numerous varieties of Berberis and Cotoneaster.

Another time of scarcity, known as the June gap, occurs after the fruit blossom and before the wild white clover. It causes concern to beekeepers whose stocks return from pollination in a flourishing condition. Observation only can help here, my bees are fond of a large bush of Stravaesia davidiana.

In Kent, wild white clover is the great honey producer. Other white clovers also yield honey. A charming plant to grow is Melilot, whose name denotes its value (Mel-honey; Lotus-flower).

A word of caution may be introduced here, Honey in quantity is only obtained from quantities of flowers and the help of garden plants is limited. For a few hives, they must be a great help and now that gardening is so popular, suburban areas provide as much, if not more, than country areas, where present farming methods kill weeds like Charlock. Clover is destroyed by excess of Nitrogen and deliberately by turf cutters. I have however seen some stretches of white clover covering the banks of new roads, glory be to the Council concerned. Beans which yield hone yare nowadays made a danger to bees by spraying with insecticide.

Late summer provides many useful flowers which are universally available, such as Blackberries and Willow Herb. So to autumn again where I see I have omitted the Virginia creeper. I apologize for any more errors of ommission, which you may correct by reference to Mr Howes' book.

AUSTRALASIAN BEEKEEPER

AUSTRALASIAN BEEKEEPER—The official organ (monthly) of several Apiarists Associations, also two Amateur Beekeepers Societies in Australia. Subscription, NZ $4.20A per year. Published by Pender Bros Pty. Ltd., P.O. Box 20, Maitland, NSW 2320, Australia.

Pest Strips to Control Wax Moths

Several Beekeepers still use pest strips to control wax moths — only the other day I was horrified to see three strips hanging in a central plant on the south west slopes.

The active constituent of pest strips is dichlorvos.

I have seen combs containing active wax moth larvae and placed on hives, that were treated a month previous with a pest strip that killed the hives out.

On no account should pest strips be used near combs.

White Clover Experiments

Smith and Johnson, Alabama, U.S.A., tested the effect of boron on soils and found that when soils contained less than 0.1 ppm (parts per million) the addition of 0.2 or 0.5 ppm increased the total sugar concentration of nectar. The addition of boron also brought about an adjustment of the ratios of sucrose, glucose and fructose in the nectar to a ratio approaching 1 : 1 : 1. The total nectar yield of the flowers varied with their hereditary capacity to yield and the time of day.

BEE WORLD

BEE WORLD—Official organ of the Bee Research Association, Hill House, Chalfont St. Peter, Gerrards Cross, Buckinghamshire, England. Subscription, £3.00 per year.

Pheromones and Hymenoptera

by JANINE PAIN

Station de Recherches sur l'Abeille et les Insectes Sociaux,
91440 Bures-sur-Yvette, France

Definition of pheromones

Pheromones are chemical substances carrying information, by means of which insects can communicate with each other by a code of chemical stimuli.

Pheromones are not in the true sense hormones, which are usually described as internal secretions that produce their effects in the organism where they originate. Pheromones are similar in that they are glandular secretions, but they are transported differently. The individual that emits them, an insect for example, discharges them externally and they are circulated by other individuals of the same group.

The definition proposed by German research workers (Karlson & Butenandt, 1959; Karlson & Luscher, 1959) is as follows: a pheromone is a substance secreted by an individual **externally.** When received by a second individual of **the same species,** it elicits a definite reaction which modifies the behaviour or the physiology of the receptor. This definition excludes a certain number of chemical substances that convey information between individuals of different species. For these substances Brown, Eisner and Whittaker(5) have devised other names. They are included in Table 1, to provide a better understanding of the position of pheromones in relation to hormones and other chemical "signals". Table 1 indicates the positions of the different substances, grouped under the general heading of semio-chemical substances as proposed by Law and Regnier(19).

Other terms would be ust as valid for designating the pheromones, including the following suggestions by various authors: ectohormones, parahormones, exohormones, telergones. On the other hand the terms allomones and kairomones are not considered very suitable by Chernin(11). They are nevertheless worthy of retention, and are included in Table 1.

In the present review we shall discuss only pheromones. These have been found to occur in every insect order, but the examples chosen here will mainly relate to the Apidae (honeybees, stingless bees, bumble bees).

Sexual pheromones

These are produced by every insect species. They are secreted from various glands — usually abdominal, as in the Lepidoptera. Generally, the pheromone is produced by the female and attracts the male, but there are species in which the male attracts the female (Jacobson, 1965). Thus, with butterflies of the family Nymphalidae, the male has organs which terminate in tufts of hair between the 7th and 8th abdominal segments. These organs produce the sexual pheromone, a scented substance which appears to be a ketone(26). Mating never takes place unless the male utilizes the organs in the presence of the female, either in flight or after the female has landed.

The sexual attractant of the greater wax moth (**Galleria mellonella**), is secreted by the wing glands of the male and has been identified as an aldehyde(31).

In the honeybee (**Apis mellifera**), the sexual pheromone is produced in the mandibular glands in the head of the female (queen), which is developed two or three times as much as in the workers. The secretion is discharged from the base of the mandibles. It has an oily appearance, and the lipids from the mandibular glands have been studied by several teams of scientists (Barbier et al., 1960; Butler et al., 1959, 1961; Callow & Johnston, 1960, Gary, 1962). Analysis led to the identificataion of a fatty acid, the **trans** form of 9-oxodec-2-enoic acid. This is the sexual pheromone of the queen, but it also has other functions. The **cis** form has no role as a sexual attractant, and indeed, any modification in the chemical structure of 9-oxodec-2-enoic acid results in the total loss of its action(2).

Drones are attracted to a queen when she reaches a height of about 12 metres; they are excited first by her movements, and then by her scent. We used the following procedure for studying the behaviour of drones, in collaboration with F. Ruttner, during August 1962 at the Biological Research Station at Lunz am See in Austria. A series of plastic ballons 130 cm high and 60 cm in diameter were used, filled with hydrogen and attached by nylon thread to a wooden support on the ground. Other tether lines 50 cm long were used to attach to a balloon either a live queen, virgin or mated, or pieces of plastic foam of about the dimensions of a queen and impregnated with different natural or synthetic "queen substances". Drones were attracted to a queen (or queen substance) when they reached a height of 6-15 metres above the ground. Observations were made with binoculars, the drones being recognizable by the hanging position of their hind legs. They could be counted, and the duration of their stay in the vicinity of a queen recorded.

We were able to confirm that the drones were attractted equally by mated and virgin queens, and also by both natural glandular secretions and by the synthetic substances. Nevertheless, when using artificial lures, there were most drones round lures impregnated with a complete extract from the mandibular glands (Pain & Ruttner, 1963). The observation was in agrement with Gary's (1962) conclusion that it is the complete lipid complex that has the greatest attraction for drones. Nevertheless in England, Butler and his collaborators (1964) found that the scent of 100 ug of synthetic 9-oxodec-2-enoic acid was as attractive to drones as an alcohol extract of the body of a virgin or mated queen.

In spite of these minor differences, it can be said that in the normal conditions of free flight, either natural or synthetic 9-oxodec-2-enoic acid attracts drone honeybees.

Apis mellifera drones that are attracted by the scent of **A. mellifera** queens, can also be attractetd by the ethanol extract of **Apis florea** or **Apis cerana** queens (Butler, Calan & Callow, 1967). The latter produces the same pheromone as **Apis mellifera** queens (Shearer, Boch, Morse & Laigo, 1970). This is also true for **Apis dorsata** queens(33).

Gerig(14) found that drones of **Apis mellifera** were equally attracted by wooden models the size of a queen (cut from twigs of walnut of varying sizes, painted in black or red) placed in drone congregation areas. These models of queens may be improved; an orifice can be made to simulate the sting

chamber. By suitable adjustment of the depth and diameter of this orifice, Gary and Marston(13) succeeded in obtaining copulations. To attract the drones, these substitute queens were coated with the crushed heads of young virgin queens, and attached to a wire queen cage containing a live virgin queen.

Recently Gerig(15) has suggested the possibility that the head of an **Apis mellifera** drone contains a scented substance that attracts other drones to drone congregation areas. The mandibular glands of the drone are very small, so it would seem rather unlikely that they could be the source of any such attractant.

Drones perceive the sexual pheromone by means of their antennae; these possess various sense organs, amongst which the sensilla placodea are very sensitive to "queen scent" and to the vapour from the synthetic acid (Beetsma, 1967; Boeckh, Kaissling & Schneider, 1966; Kaissling & Renner, 1968; Rutner & Kaisslin, 1968).

I have attempted to offer pieces of filter paper impregnated with the synthetic acid to caged drones in the presence of a small number of workers, but in such circumstances the drones never exhibited the slightest interest in the papers These chemical substances attract drones only in certain conditions. The 9-oxodec-2-enoic acid stimulates the drones at a distance as they fly towards the queen against the wind. In these conditions it is a sexual attractant, but it is also an aphrodisiac: it incites the drone to copulate, provided that the sting chamber of the queen is open (Butler, 1967). In the course of this process, the abdominal glands of the queen situated on the tergites play a similar role, producing a pheromone not yet identified(8).

According to Butler and Fairey (1964), another acid contained in the mandibular glands of the queen also attracts the drones. This is 9-hydroxydec-2-enoic acid, which has a chemical structure closely related to that of the 9-oxodec-2-enoic acid, but is less effective as a sexual attractant. The two acids also have other functions as aggregation pheromones.

With other Apidae such as bumble bees, it is the males which produce pheromones (from their mandibular glands) that are attractants both to other males and to young queens. In Sweden 31 volatile substances have been identified in the cephalic secretions of 14 species of **Bombus** and of 6 species of the parasitic **Psithyrus**; amongst these substances are several terpenes, alcohols, aldehydes and esters, and the secretion appears to be characteristic for each species (Kullenberg, Bergstrom & Stallberg-Stenhagen, 1970).

In 1971 Holldobler established for the first time the source of the sexual pheromone in an ant: a glandular secretion from the venom glands of female **Xenomyrmex floridanus** has both attractive and aphrodisiac properties.

Conclusion

The present article has been concerned particularly with pheromones that govern the social life of the Apidae, but similar systems of chemical communication also exist among non-social Hymenoptera such as the defoliators (Coppel, Casida & Dauterman, 1960; Bobb, 1964) and parasitic species (Boush & Baerwald, 1967; Cole, 1970).

Complex behaviour is also observed in insects belonging to other orders, for example the reactions of a termite to synthetic trail-marking pheromone(21). Substances that are sexual attractants have also been studied in non-social insects such as **Scolytus**, Coleoptera that attack conifers(38), and numerous

Lepidoptera(34). The study of the sexual pheromones of Lepidoptera has given rise to practical applications in pest control; the insects themselves, or extracts from them, or synthetic pheromone, are utilized to capture the other sex of the species to be destroyed.

With the honeybee, the pheromones of queens and workers can be exploited for other purposes. At present practical applications are being explored along two lines: controlling the foraging activity of workers and controlling mating between the queen and drones.

Foraging activity can be controlled by the queen pheromone: a small queenless colony will maintain its cochesion if it is given synthetic queen substance as a "substitute queen" (Showers, 1967). If 9-oxodec-2-enoic acid is given in large doses on blocks of porous plastic, foragers are stimulated to collect nectar (Jaycox, 1970a). It seems that a pheromone is also implicated in pollen collection (Jaycox, 1970b). Worker pheromones can also be used for practical purposes: solutions of citral, geraniol or other substances, allowed to evaporate on fields of lucerne (**Medicago, sativa**), are very attractive to foragers (Waller, 1970). Use can be made of these findings in the study of the pollination of agricultural crops.

Mating behaviour can be controlled in several ways by the use of pheromones. It is possible to create artificial drone congregation areas by using large quantities of the synthetic sexual attractant (Strang, 1970). This procedure may be applied to encourage mating within a certain desired territory. In normal conditions, the limits of drone congregation areas are not always clearly defined, and the use of lures or substitute queens makes it easier to localize them.

Until recently it has not been easy to observe mating behaviour closely in natural conditions. This is, however, now possible with the new technique developed by Bary and Marston(13) whicch uses wooden models of queens. Morever, the drones can be retrieved and examined. Mating can now be obtained at the moment chosen by the experimenter, and at the place chosen or created by him. These developments will almost certainly lead to applications in honeybee breeding, selection and hybridization.

Finally, in Table 2 we present a summary of the honeybee pheromones so far known. Of the 31 substances believed to exist, 13 have been identified. The role of only two of them is known (Callow, Chapman & Paton, 1964; Callow(10); Barbier(1); Pain, Barbier, Bogdanovsky & Lederer, 1962). We are thus still a long way from a complete knowledge of this important subject, and much further research must be done, both practical and theoretical, before we fully understand the pheromones of the honeybee, let alone those of the entire Order of Hymenoptera.

EDITOR'S NOTE ON REFERENCES: For economy of space the comprehensive list of references has been omitted. Should any reader wish to have the list for reference, a photostat will be supplied on application.

OBITUARY

ECROYD, Arthur. — There will be few homes amongst the Beekeeping fraternity in N.Z. where the name Ecroyd is not well known and highly regarded.

There would be few homes amongst the beekeeping fraternity in New Zealand where the name Ecroyd is not well known and highly regarded.

The now thin rank of his contemporaries has lost a stalwart who gave of his best during a particular era of struggle and development, during which a foundation was laid for the prosperous Beekeeping Industry we know today.

In the late 1920's and early 1930's interest in beekeeping and in the National Beekeepers' Association was at a very low ebb. It was at this time that Arthur Ecroyd's work for the Association made its greatest impact.

For many difficult years he ably held the office of Dominion General Secretary as well as the Secretaryship of the Canterbury Branch; at first for a period without remuneration, and later with nominal reward.

(In 1930 N.B.A. income was as follows:

Membership Subscriptions	£131
Government Grant	£100
A total of:	£231

Of this £74.5.4 was returned to Branches for their domestic use, leaving the sum of £156.14.8 on which to finance Executive expenditure. Conference expenses in that year were £18.3.11).

The success of his business career in Bee Supplies was based on earnest endeavour, service and integrity, but, in addition to the spur of personal achievement, he had a vision of a well organised, prosperous Beekeeping Industry in which the N.B.A. would play a vital part. To this end he, and a small band of loyal supporters, worked untiringly during a period of depression which, at times, bordered on despair.

In addition to his Secretarial duties he was a Director on the Board of the New Zealand Honey Producers Association — a honey marketing organisation founded in an attempt to retrieve the local market from a state of utter chaos, itno which continued price cutting had forced it. (Buyers quotes of 3d per pound were not unknown at this time.)

Arthur Ecroyd first became interested in beekeeping in 1912. He commenced Comb Foundation production by the dipping process in 1913. Served in the Great War 1914 to 1918. He resumed Foundataion manufacture in 1920 by the "Dittmer" or 'Slab' process and later imported machinery to enable the revolutionary "Weed" roller" process to be employed, with outstanding success.

He was the founder of the business now known as A. Ecroyd & Son Ltd. and, in recognition of his services to the Beekeeping Industry, was elected a Life Member of the National Beekeepers' Association of New Zealand at the Christchurch Conference in 1967.

In the days when motor transport was much less reliable than it is today, he visited almost every beekeeper known to him in the Dominion in a model T Ford. Many were his difficulties and adventures on outback roads, which were then little more than clay tracks. Perhaps his greatest feat in motor engineering was to make, on the spot, and replace a shorn off pinion gear key in the differential of his Ford, under appalling conditions on the roadside in South Westland.

Our new generation of beekeepers still faces the challenge of problems, but they also enoy many advantages which were not the heritage of their forebears. Amidst the toil and bustle of like in our day, it is well to pause sometimes and pay tribute to those who have gone before. Very truly "Others have laboured and we have entered into the fruits of their labours."

A tribute from T. E. PEARSON, Darfield whose association with Arthur Ecroyd extended over a period of more than 50 years.

NELSON, William Wallace — The passing of Wallace Nelson has removed from the beekeeping scene one of its most prominent and colourful personalities. About 50 people attended the funeral at Takapuna including a number of prominent beekeeping personalities.

From the early 1920s to the mid-1950s Mr Nelson was engaged in commercial honey production in the Otorohanga district. During all that time he took a full and active part in the work

of the National Beekeepers Association, being President for a period. He was also active in the formation and operation of various honey marketing organisations including the Honey Producers' Association, N.Z. Honey Ltd., and was also a member of the Honey Export Control Board.

During the course of several visits overseas he investigated marketing proceedures in other countries and was largely responsible for the design and layout of the packing plants set up by the Marketing Department in 1939 and the Honey Marketing Authority in 1957.

He served on the Honey Marketing Committee during World War II and was a member of the Honey Marketing Authority from its inception in 1953 until 1960. His services to the industry were recogaised by his appointment as a Life Member in 1957.

His vivid memories of the depression in the thirties exerted a strong influence on his administrative work. He had a vision of a well organised marketing system which would give the industry stability and strength. He never wavered from this determination despite strong opposition from some beekeepers whose rugged independence was not always amenable to rules and regulations.

His singleness of purpose in striving towards a goal which would ultimately be of benefit to all in the industry even though they could not see it at the time earned him universal admiration. His name is remembered with great appreciation in the annals of Beekeeping in New Zealand.—A tribute from John McFadzien (Hastings) and J. R. Barber (Pio Pio).

Branch Notes

NORTH OTAGO

The visit of our National President, Mr Dickinson, to our Branch Meeting on March 6th was a rare privilege and members were pleased to welcome him. His talk on the inside workings of our Association was very interesting. A general discussion on the financial side of our organisaation was held while he was present and the Branch members agreed to make a donation to N.B.A.

The honey crop prospects in our area looked the best ever by mid-November after a slow start in the spring with cold damp conditions prevailing. As the year progressed the prospects of a good crop diminished with the dry winds and by the end of the year our main nectar flows were virtually gone. The final crop was below average.

Branch members are not happy at the Ministerial intervention to hold the maximum payout by the H.M.A. at 20 cents for the season. In our opinion any surplus should be held to the credit of the individual beekeeper to be paid out later as a bonus on the quantity of honey supplied for the year.

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The undoubted success of the Timaru Seminar has prompted our Branch not to hold their Annual Field Day this year — Reported by R. M. McCallum

Editor's Note.— I find it very hard to accept the fact that 14 other Branch Secretaries or Scribes are so busy or so lacking in news that they have nothing to report. Even a growl about the weather, or the wasps, would be acceptable. I would have thought the personal letter I wrote would bring more than one reply.

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THE N.Z. BEEKEEPER

The subscription rate for all members is $1 per year, all others $2 (NZ) per year. Please check the exchange rate in your country and send an amount to produce $2 (N.Z.) here. For example it now takes $2.65 (US) to make $2 (NZ).

Literary contributions and advertisements must be in the hands of the Editor, Mr N. S. Stanton, P.O. Box 4106, Auckland, not later than the 25th of the month preceding publication.

Nome-de-plume letters must be signed by the writer and address given, not necessarily for publication, but as proof of good faith. Letters accepted for publication do not necessarily express the views of the Editor or the Executive.

ADVERTISEMENT RATES

Quarter Page	$5.00	Per Inch	$1.50
Half Page	$9.00	Min. Charge for each insertion	75c.
Full Page	$16.50		

FRONT PAGE STORY

BEEKEEPER'S DISCUSSION GROUPS

Discussion groups have been common among farmers for many years, and some beekeepers' groups are now functioning successfully. Basically a discussion group is a small group of beekeepers who meet in company with an apiary instructor to talk "shop".

The informal atmosphere is very conducive to the exchange of ideas and information between members. Topics for discussion should be confined to aspects of beekeeping management: marketing and beekeeping politics are best left for the various industry organisations to deal with.

To be successful a group should meet regularly, discover common problems and suggest solutions which lead to individual action.

The cover picture shows members of the North Otago beekeepers' discussion group watching Mr W. Irving of Kurow loading a comb into his uncapping machine — apparently no laughing matter! The others are from left to right, Messrs R. M. McCallum, G. E. Winslade, B. O'Neill, R. B. Mackie (partly obscured) and C. M. Lory.

The main talking point at this meeting was how best to handle wax cappings.

Photo: V. A. Cook

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