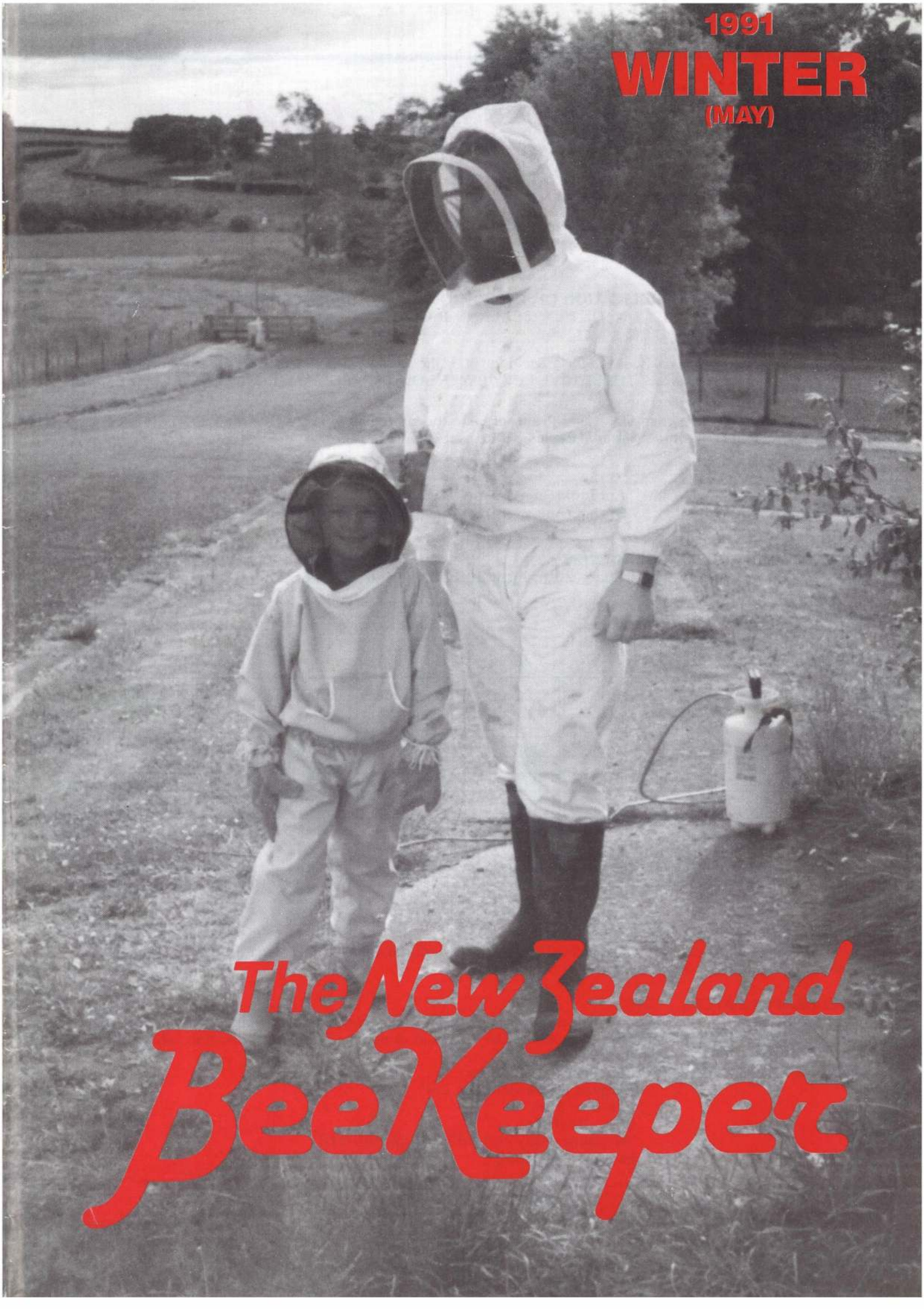

1991
WINTER
(MAY)

The New Zealand BeeKeeper

The New Zealand BeeKeeper

OFFICIAL PUBLICATION OF THE NATIONAL BEEKEEPERS' ASSOCIATION OF NEW ZEALAND INCORPORATED

CIRCULATION, 1,550. . .
To Members of The National Beekeepers' Association of NZ Inc. who own more than 50 hives each and so are legally subject to the annual hive levy. **THESE HIVE-LEVY PAYERS OWN APPROXIMATELY 87% OF ALL BEEHIVES IN NEW ZEALAND.**

To Beekeepers with less than 50 hives who subscribe to the journal at $33.75 a year (incl. GST) which also includes membership of the National Beekeepers' Association of NZ Inc.

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The New Zealand BeeKeeper

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FOOTROT FLATS™

Diogenes Designs Ltd

FRONT COVER: In November last Mathew Van der Hulst turned six. Since he has shown an interest in his Dad's bees his Mum, Toni, made him his own bee suit. Here he is off to help Dad, John, with the hives. Mathews' grandfather also keeps bees which makes Mathew the third generation of Van der Hulsts to have honey in his veins.

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Disease Control — Are you prepared to do your Bit?

From John Heineman and Allen McCaw

AOTEAROA — a beautiful land somewhere in the Great South Seas. Mountainous and bush-clad for the greater part and at first inhabited only by many bird species, large and small, and a few small creatures such as lizards and insects. Man was absent for a long time, for these islands were very remote from the rest of the earth's land masses, and lay undisturbed.

Then one day a group of the human species arrived from the northeast in their great canoes and settled and multiplied. A good few centuries later others arrived in sailing ships originating from the opposite side of the globe. At first they were hunters and traders, but were inevitably followed by settlers in search of new lands and keen to share in the bounty this favoured country had to offer.

Settlement also meant they introduced many of their domestic animals, including eventually the honeybee species — Apis hitherto not found in this remote region. And together with these animals came many of their diseases and pests. In the case of honeybees, Bacillus larvae, nosema and perhaps some others were introduced.

Over the decades, some wise and forward-looking officials changed the ways of animal husbandry, introduced better management methods, sought to combat existing pests and diseases, and developed good legislation and controls to keep any further "nasties" out of this country, now known as New Zealand. They realised the advantages of our natural remoteness from the rest of the world, and that largely by chance, a great many other very serious pests had not arrived with the original importations. New Zealand began to develop an enviable reputation as a source of healthy primary produce and quality animal and plant breeding material.

This still holds true today, but the question has to be asked: for how much longer? Our remoteness has diminished by modern communications and travel. With the frequency of transport, the arrival of abundant goods from all parts of the world, and a regular daily influx of people, the task of our Customs and Agricultural Quarantine services has become onerous indeed, and cannot be expected to be totally foolproof.

Add to this the recent political influences whereby free-trade pracctices and promotion of increased tourism is being advocated as a panacaea for our economic difficulties, and it no longer becomes a question of "IF" some new problem arrives here. Rather, we are faced with contemplating what we will do "WHEN" the situation occurs. **POSSIBILITY has changed to PROBABILITY.**

This is why the NBA Executive has recently sent out a questionnaire to branches and some individual members posing a number of hypothetical,

but serious, future situations where discovery of an exotic bee disease or pest has taken place. Also included were questions regarding the attitude of beekeepers towards the use of drugs or chemicals for the treatment of European Foulbrood, AFB, and mites, etc.

The questionnaire also sought comment on a fair composition of an action committee to be formed **before** the occurrence of such an emergency in order to be ready to deal with it in the most appropriate manner.

What of the response to this questionnaire from the industry? To say disappointing would be an understatement. Dismal is more apt.

It is also the reason why the Executive, with financial backing from the Industry Trust Funds, judged it prudent to commission a report from MAF Quality Management summarising the research and practical experience gained worldwide in the use of drugs and chemicals to combat bee diseases and pests. Under the title "Feeding Drugs to Honey Bees to Control Diseases — some of the issues", the report represents a well-considered and informative document.

Topics covered include a history of AFB developments in NZ: disease-resistant strains of bees; effects upon AFB levels of antibiotic drug use; antibiotic resistant strains of AFB; contamination of honey with antibiotics; benefits of drug feeding; availability, cost, and legal implications of feeding antibiotics; suggestions for further research; and a discussion of EFB and drug feeding as a control measure.

The report assists in pinpointing the problems which must be addressed in considering drug feeding, and some of the options available based upon present scientific and practical beekeeping experience. It is stressed that the paper is NOT meant to be a policy document — either for the MAF or the NBA. The work in forming industry policies in the use of drug feeding now or in the future has yet to be done, and is presently under consideration by the Executive in this year's Industry Plan.

As an industry we have for many years followed the policy of eradication of AFB (B.L). The disease was reported as early as 1877, and played havoc with the early development of beekeeping. Eventually, legislation was adopted fostering better management methods and imposing controls which involved regular inspection of bee colonies and the burning of infected hives. The incidence of AFB since that time dropped substantially, until in 1970 only 0.4% of hives were reported infected. These infected hives were found in 2.7% of apiaries.

However in 1990 the picture again became disturbing. Most recent statistics show infected hives at 1.2%, found in 7% of registered apiaries, which represents a trebling of disease incidence in two and a-half times as many apiaries. This, of course, takes no account of unscrupulous or ignorant beekeepers who do not register apiaries or report disease incidence.

Some reasons for this trend appear fairly obvious. Hive numbers have increased markedly — as have beekeeper numbers. (Both dropped slightly for 1988'90). Pollination activity has multiplied rapidly, involving large concentrations of hives, in kiwifruit in particular, and transportation of hives over long distances.

Stress and drifting are often the result, and intensive management methods to achieve rapid build-up of colonies, sometimes by inadequately experienced or trained operators, all add to the potential for disease spread. When these are added to a dramatic contraction of apiary advisory services from the Government, then perhaps it is not entirely surprising that AFB levels have risen in proportion.

Some questions come to mind as a result of this present trend. Are we fighting a losing battle by adhering to our established control methods? Is it time to alter course? Will alternatives such as drug feeding lead to more efficient management and consequently save us dollars?

Could we jeopardize our good reputation here and overseas as producers of high-quality products through the possible risk of antibiotic residues in honey, as has been the recent experience in other countries where more diseases and pests are prevalent? What of the expanding and potentially lucrative organic food market which NZ honey should all be ideally suited for?

Will it still be necessary to destroy hives which show AFB infections even after drug treatment? Is it inevitable that drug feeding is the only option to combat European Foulbrood if it should arrive here? What is the likely risk of EFB arriving in the near future as present free-trade policies, such as CER with Australia, lead to the development of protocols to allow heat treated honey imports to New Zealand?

The fact remains that we are faced with some very complex problems which call for thorough consideration and sound judgment. The writing appears to be on the wall, and with the familiar back-up of free MAF experience and advice in the past, now carrying a price tag if we want it, then the past practice by many beekeepers of adopting the "ostrich" method to solve problems simply will no longer do. We must be prepared to adapt to change, and urgently prepare for any unwanted problems **before** they land on us.

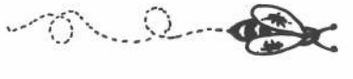
It is for this reason that the Executive has been actively pursuing the question of funding for disease inspection services over the past five or six years. And also why we are, right now, being requested to make our collective needs and preferences known in the redrafting by MAF of emergency response procedures to combat an exotic disease outbreak.

No longer are they telling us what will happen — we are being asked to tell them what we want to happen. We have a **right** to be asked under a democratic system, and equally we have a **definite duty** to respond. There are many questions and problems to consider and time is running out. It is essential while facing such radical changes that the greatest number of different viewpoints be heard so that decisions can be taken with confidence now to serve the beekeeping industry as well as humanly possible in the future.

If we allow lethargy to prevail, then a small number of concerned individuals will be left to make the decisions. No one will have the right afterwards to lay the blame for disagreeable or unsuitable measures at the doorstep of officials or industry leaders unless they have taken the opportunity to contribute beforehand.

The MAF report on drug feeding addresses some of the issues before us. It is clear and informative, and above all understandable. Copies are available from the NBA Executive Secretary at a cost of $5 for re-production, or may also be borrowed from the NBA Library, P.O. Box 112, Milton.

Of one thing we can be reasonably certain: Apis mellifera will survive, as it has done for centuries, together with all the bugs, diseases, and pests. Whether beekeeping also survives as a viable (sometimes even profitable) enterprise in future is perhaps more questionable. Much will depend on the decisions we make now, just as our present existence depended upon the early pioneers of the industry as they faced the particular problems of their times. It is nearly always later than you think. As the barmaid said: "Time, ladies and gentlemen — NOW!;;



Dear Sir,

Paradicholorobenzene? What is it, can I eat it and will it make my hair grow?. But seriously though I would like to know how it's made and from what, what residues are left behind and how does it work — can someone help?

Colin McLean
Napier

Dear Sir,

I must confess that as a relatively recent entrant into beekeeping, I was astounded to see an article under 'What Price Ethics' in your magazine. My experiences since joining this band of entrepreneurs had led me to believe that, with one of two exceptions, beekeepers have no ethics other than greed, and if you can do harm to your fellow apiarist, then do it.

What!!! Shock! Horror! Surely Not! Believe me I do not lie. And I do not overstate the matter.

I personally have seen, infighting in branch organisations, savage price wars amongst apiarists, an attempt to steal each others outlets, retailers forced into overdraft to purchase a year's supply of honey because the apiarist would not sell it any other way. I know of hobbyists hives overturned by a commercial keeper to give him the message.

In my own case whilst suffering from an accident injury, I received 'phone calls from apiarists offering to take my hives off my hands for $50 each on site, payable at the end of the season. I had an offer to use my hives at no cost to me until I got better. I could go on and on about disease witch hunts, threats to burn me out, complaints of neglect, attempts to steal sites, etc...but find the whole episode quite disgusting. Also during this period, some eighteen months, I received not one offer of assistance of any description. So you can see my astonishment is quite well founded.

If people are going to point the finger at others and scream ethics, remember three fingers point back. When your own house is in order than and only then should you think about tearing into others.

N.E. Minchington

Dear Sir,

My name is Hilpi Kylanpaa. I'm an agronome from Finland. I've got your address from a Finnish bee researcher Kari Koivulehto. I would like to subscribe to the New Zealand Beekeeper. Would you please send me the number of the postal giro account, where to pay it and tell me how much does it cost? Thank you! I also have a Hungarian friend who is a beekeeper. He would like to advertise in your paper. How much will it cost? The text would be the following:

Hungarian beekeeper would like to correspond with beekeepers in New Zealand, later possibly working there. Kind answer Gombos Sandor, Abasar, Dobo u. 34,3261, Hungary.

Hilpi Kylanpaa

DON'T FORGET THE CLOSING DATE TO BOOK FOR CONFERENCE IS JUNE 4.

EXPORTING

The NBA has, with the assistance of its members, established an export liaison group. This group will assist members who:

a) may be considering exporting

or

b) wish to discuss an exporting matter with someone else in the industry.

The following members will be pleased to provide information for members new and inexperienced in the export of honey.

ORGANISATION	CONTACT PERSON	TELEPHONE NO.	FAX NO.
Airborn Honey	Peter Bray	(03)243569	(03)243236
Arataki Honey	Percy Berry	(070)775790	(070)775076
Ceracell Products	Stephen Mahon		(09)2740368
Kintail Honey	Dudley Ward	(0653)48301	(0653)49209
	Jane Ward	(0728)58038	
NZ Honey Producers Co-Op	Kevin Ecroyd	(056)48882	(056)84859
Southern Honey Exports	Allen McCaw	(03417)7198	(03417)7198
Waitemata Honey	Neil Stuckey	(09)4038491	(09)4038556

QUEEN SUPERCEDURE AND PRODUCTIVITY

By Reg Clarke

A research project is under way in Marlborough with the aim of comparing the performance of two groups of queens. Stage 1 — the end of the first years work — was recently completed with the willing and invaluable help of local branch members. Queen survival and honey production was recorded and analysed in relation to a number of factors. In the main, the results confirm what has already been demonstrated by others. In regard to supercedure, a very interesting new possibility emerged.

The project started in March 1990, when a suitable site was chosen, and 24 hives requeened. Twelve hives received control queens, and the others experimental queens. Previous work has shown that the experimental queen production method used has small but potentially important effects on queen weight and reproductive organ development. This trial was designed to look for effects on queen survival and productivity.

Production of Queens.

A single drone inseminated mother queen was used to produce these queens and another group that were sent for laboratory examination as young queens. These daughter queens, being super-sisters were expected to be less variable than queens from a natural multiple drone mating, and thus permit valid results to be obtained from a small-scale trial. The queen cells were started in queenless starter hives fed only sugar syrup. After 24 hours they were transferred to queenright finisher hives. These hives were standardised as carefully as possible, including their queens, which were also daughters of a single drone insemination.

The finisher hives were divided into two groups; the control group was fed plain sugar syrup, and the experimental group sugar syrup with added vitamins and minerals. There is not space here to discuss the feed recipe in detail, but the mineral supplement is designed to correct what are believed to be deficiencies in the local pollen. Mineral analysis of pollen from the queen raising site shows that in relation to values reported in the literature, the content of sodium, zinc, copper, cobalt, and manganese are at or below the lowest reported levels. In addition iodine and selenium are also probably very low, but for these two elements the data is insufficient to indicate normal levels.

The queens were removed from mating nuclei after laying four to six days, weighed and colour marked using two colours to distinguish the queen groups.

The Trial Site.

The site chosen has a record of above average production, with good early flows from willow, barberry, and manuka, followed by summer flows from clover and lucerne.

Work begins at the site.

Queen Introduction.

Trial queens were introduced in March 1990, using standard mailing cages, and distributed in a randomised pattern to eliminate the effect of drifting on the results. Two queens — both from the experimental group — were lost at this stage, and the hives replaced with reserves. In one case no cause was apparent, but in the other a second old queen was found, and from colour marks it was clear that two queens had shared the brood nest for over 12 months.

Hive Management.

The spring inspection was done on Sept 12. Additional frames of honey were given where needed, and it was noted that two control queens had been superceded. On Oct. 11 control queens were again checked owing to doubt about the permanence of the paint used, and they were re-marked with a more reliable preparation. Two more supercedure queens were noted. The brood boxes of all hives were reversed as a swarm control measure. Thereafter the only work done at the site was to add honey supers as required. In January, two full supers were removed from each hive, and the weights recorded.

End of Season Evaluation.

On 17 March 1991, with the welcome assistance of other local beekeepers, the season's work was completed. After removing bees with a bee blower, the honey supers were weighed, brood inspected, and queens all located. The two full depth brood boxes were also weighed. From the total gross weight so obtained for the hive and contents, standard deductions were made for hive woodware. This gave a net weight for all bees, brood, pollen and honey stores for each hive, and this figure is used in the tabulated data below. The surplus honey crop is approximately 20 kg. per hive less. Weights were not taken on setting up or in spring, so there may be small errors due to differences in stores, which were equalised by estimation.

No disease problems were found, and no hive had swarmed. All 12 of the experimental queens were still present, as were the eight remaining control queens seen in October.

Data.

Production.

Mean values based on net weights of bees, brood and stores.

Experimental hives (all 12) — mean net wt. 88.88 kg.

Control hives with trial queen (8) — mean net wt. 82.24 kg.

Control hives (all 12) — mean net wt. 79.42 kg.

Hives with supercedure queens — mean net wt. 65.39 kg.

Hives with low spring stores — mean net wt. 82.24 kg.

Range of net weights — 102.24 to 43.29 kg. Mean value 84.15.

The effect of queen weight on production.

Queens 270 mg and above.

Both groups (14)	90.36 kg.
Exp. group (9)	90.28 kg.
Control group (5)	90.51 kg.

For queens below 270 mg

Both groups (6)	82.16 kg.
Exp. group (3)	84.67 kg.
Cont. group (3)	79.66 kg.

Range of values — Queen Weight.

Experimental group — 288 to 263 mg. (mean 275.1)

Control group — 294 to 255 mg. (mean 272.6)

Discussion.

Assuming that the weight of bees, brood, and pollen included in the above data are approximately constant, the variation is in the saleable honey crop, which is valued at $1.80 per kg to illustrate the economic impact. Production from the experimental hives exceeded that from the control group (excluding supercedure hives) by 8% or $12 per hive. Heavy queens outproduced their lighter sisters by 8.20 kg., worth over $14 per hive, but for queens of similar weight production was not affected by queen production treatment. The difference favouring the experimental group arises from the fact that the control group included more low weight queens. However, that is a treatment effect: the nutritional treatment used reduces the number of smaller queens produced.

Supercedure had a major impact on production; causing a reduction of 20.80 kg. or $37 per hive. Only queens in the control group were superceded — four out of 12 or 25%. These were in the average to below average weight range — 275, 271, 260 and 256 mg.

The fact that supercedure was confined to the control queens raises a very important possibility: that queen supercedure may be influenced by nutritional deficiencies during the queen's larval phase. In an associated experiment, 40 sister queens were subjected to laboratory examination of their reproductive organs. This disclosed only very slight differences, except for one aspect, which may be relevant here. The experimental group of queens had higher sperm numbers and sperm density in a spermatheca of the same mean volume. That effect was also seen in a smaller group the previous season. Does this point to a nutritionally induced difference in mating behaviour, possibly connected to queen pheromone levels, which would also affect supercedure?

The scale of this trial was too small to give a fully reliable answer on this important point, and the experiment needs to be repeated with a larger sample.

Conclusion.

This trial highlights some points of economic importance to commercial beekeepers. Queen supercedure was associated with a major drop in production, and so needs to be reduced. More effective action could be taken, given a greater knowledge of the causes of supercedure. Queens of above average weight outproduced lighter queens by an amount that more than covers the extra costs involved in producing such queens.

Our knowledge of the subtle effects of nutrition on bee health and productivity is still very limited, and more work needs to be done on this question. This is of particular importance in New Zealand because our soils are commonly deficient in a number of important minerals and trace elements.

The trial will continue for a second season, to see if the pattern is repeated. Then, if sufficient of the original queens remain, they will be examined to obtain data on the residual sperm numbers. This, compared with sperm counts done on sister queens which had just started to lay, will give a good indication of annual sperm utilisation.

The process of weighing.

New Zealand's First Beekeeper Arrives Home

From Bruce Stevenson

On Saturday March 9 beekeepers from the Northland Branch of the National Beekeepers' Association celebrated the 150th anniversary of the arrival of the first honeybee hives into our country. The celebration involved retracing the last stage of the sea voyage of the "JAMES" with it's two straw "skep" hives which were landed at the Wesleyan Mission station at Mangungu on the upper Hokianga Harbour. It is amazing to think that the bees actually survived the six-month sea voyage from England. The bees probably enjoyed a brief respite on land at Cape Town and again a much longer break at Hobart where the "James" stayed for five weeks before setting off for the last stage of the voyage to the Hokianga harbour. The 'JAMES' left Hobart on March 9 and 10 days later crossed the bar and anchored at Pakanae. On March 20 she sailed up the harbour, past Rawene and finally anchored at Mangungu.

The "Sierra", the local Hokianga charter boat, was hired by the beekeepers for the occasion and a turnout of over 30 people enjoyed the trip. We viewed the splendour of the harbour and tried to imagine the impression it must have made on the missionaries arriving here 150 years ago. Early records indicate that all were on deck to view the strange new land and that there was much joking between the ships officers and the large mission party as to whether they would find anything to eat on shore, or whether they themselves would be on the menu!

Mary Anna Bumby was this country's first beekeeper. She arrived at Mangungu on March 20, 1839 with two honey bee hives which came from the Thirsk area in North Yorkshire. It is thought that the bees were the Black or "German" type, or perhaps more accurately known as the north European bee. She had come to New Zealand to act as housekeeper for her brother the Rev. John Bumby. It is said that she brought the bees because of her brothers' fondness for honey on his toast! She was described as a vision of delight, with a complexion that entitled her to the name of "bonnie English rose".

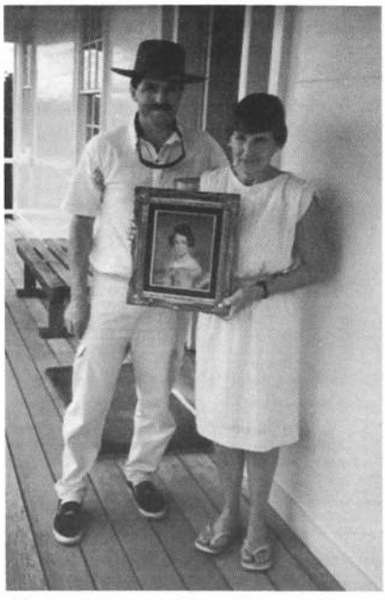
Her job as housekeeper for her brother came to a rather sad end because in June 1840 John was drowned in a tragic canoe mishap in the Hauraki Gulf. She stayed on at Mangungu until she married in December 1840. The death of her brother was said to have had a devastating impact on Mary Anna and she was described as a much changed woman from the one who arrived four years earlier. As a point of historical interest, Mary Anna was hostess to governor Hobson and his party when they stayed at Mangungu to get signatures from the local Maori chiefs for the now famous Treaty of Waitangi. Perhaps Mary Anna and Governor Hobson shared a common interest in bees because Lady Hobson is recorded as bringing stocks of black bees to the Bay of Islands in early 1840. Early eyewitness accounts of these bees arriving suggest that the straw hives were wrapped in wet blankets probably so the evaporation would keep them cool.

The bees were kept inside the fenced mission grounds at Mangungu appar-

Above: *Derek Bettesworth, Don Hoole and others.*
Right: *The Bielby family.*

ently to "keep them away from the very curious Maoris". Quite how these new arrivals were perceived is now a mystery but an 1848 account claims that the Maoris called the honey bee: "the white man's fly".

A framed picture portrait of Mary Anna was presented to Mrs Margaret Exton, who administers Mangungu Mission House for the Historic Places' Trust. It will join portraits already on display of her brother and also her husband, Gideon Smales. Mr William Bielby, a former advisor in beekeeping in Yorkshire spoke to the assembled crowd at Mangungu. In his research he found that there are still three Bumbys on the Thirsk district beekeepers membership. Mr Bielby sent samples of black bees from the Hokianga to Rev. Eric Milner in Ossett, Yorkshire. Milner, in association with Professor Ruttner, has just published an interesting book called "The Dark European Honey Bee", the result of 40 years of research. The Hokianga bees get mention in this book because it appears that they are statistically identical with the dark European bee, on the basis of morpho-



Above: *Margaret Exton from the Historic Places Trust and Bruce Stevenson, President Northland Branch with the picture.*
Left: *The picture of Miss Bumby.*

metric data, and even bees examined from an ancient York Viking archaeological excavation. That should be of real interest to our queen breeders. Fascinating to think that the original Bumby bees may still be found as a pure genetic line after 150 years.

The 150th anniversary of the first honey bees is an important milestone for the New Zealand beekeeping industry. From Mary Anna Bumby's two beehives the industry has steadily grown to the present day where we have over 6,600 beekeepers who look after something like 330,000 beehives. For those sharp wits out there who have noted that we are actually one year late in celebrating this 150th: congratulations. The initial moves were made some time back but the wheels of democracy move slowly, like the rest of our industry! Chris Dawson from Timaru started the ball rolling some years ago but finally gave up because nobody seemed interested. Since then the Northland Branch, the Executive, the Historic Places Trust, and MAF have been involved. The picture was secured by MAF and paid for by the NBA and finally sent to the Northland Branch to organise a suitable presentation.

Top left: *Terry Gavin, Whangarei and Jack Tait, Ohaewhai.*
Top right: *David and Janice Marley and family, Kerikeri.*
Middle: *George Nicol (described as an ancient beekeeper) and wife Pamela, both contributors to the New Zealand Beekeeper.*
Right: *The voyage out.*

UNIDENTIFIED FLYING QUEENS

By Bill Keir

Let's have a closer look at Reg Clarke's account (NZ Beekeeper, Autumn 1991, page 15) of a beekeeper who claims a marked, laying queen transferred herself from a nucleus to a neighbouring strong hive.

Did the queen transfer herself? Is it an unexplained, unprecedented, extraordinary mystery?

We can't answer that unless we have answers to some other questions:

Did the beekeeper keep written records of his actions including dates of apiary visits and verifiable methods of identifying hives, equipment and manipulations?

Did he have an independent witness or witnesses such as assistants helping with hive manipulations and data recording?

What queen introduction methods does he use? (Was the empty introduction cage still in the nuc when he found the marked queen in the strong hive?)

What sort of operation does he run — honey production, queen rearing, research?

How big is his operation?

How many apiary visits does he make per week/month/year, on average?

How many hives/nucs does he requeen every year?

How often does he use marked queens?

What is his marking code? Is it confusion-proof?

There are many other unanswered questions.

We have to congratulate the beekeeper for having a marked queen in this case. But if he did not keep written records and did not have witnesses we are on shaky ground if we accept the extraordinary explanation uncritically. The fact that the queen was marked (and had a gammy leg as well) makes it look like a conclusive case. But this is misleading. In the absence of further hard data other explanations are still possible.

Reg Clarke's comparison with unexplained UFO accounts might give us a clue about the explanation.

There are many unexplained UFO accounts, but they are not inexplicable. Ninety per cent of UFO reports are found, on detailed investigation, to be misperceptions of misinterpretations of ordinary phenomena. This is based on a systematic analysis of 1,300 cases in the USA in the 1970s by Allan Hendry (see his book **The UFO Handbook,** 1979). The other 10 per cent remain unexplained because of insufficient data rather than inherent extraordinary features.

The main causes of extraordinary UFO reports are faulty data-gathering methods and faulty recall of events. Other factors include the well known human tendency to credulity and the tendency to carry a load of unexamined assumptions about the paranormal.

These assumptions predispose even highly intelligent, well educated, sober, sensible people to make simple mistakes in observation and recall. The result is that false causal connections are made between unrelated events, different events are falsely assumed to be the same event, and eyewitness accounts are accepted too uncritically by the gullible or the overtrusting.

Faulty recall is a daily phenomenon well known to everyone. An example from my own experience is that of a farmer friend who dumped his spray knapsack in a clump of rushes at the end of a weed-spraying session. When he returned a few days later he couldn't find it.

A few months later he got me to do some spot spraying in the same paddock using a new knapsack, bought in much anger and at great expense to replace the lost one. That was when he told me the saga of the lost knapsack. He went into great detail about how he had left the knapsack in an easily identifiable clump of rushes on the north side of an easily identifiable creek. He could only conclude that the knapsack had been stolen.

Well, in the course of spraying the same paddock I found the errant knapsack. It was in a prominent clump of rushes, obviously exactly where he had dumped it, but it was on the **south** side of the creek. An error in one single detail of his recall had led to a string of false assumptions.

Faulty data gathering methods are illustrated by the account of another farmer friend of mine. He told me how he was sitting in a paddock one day, looking up at the clear blue sky, when he noticed a round white object moving across the sky. While he watched it changed direction several times, sometimes very abruptly, and performed some spectacular manoeuvers. For a moment he thought he was observing a UFO. Then suddenly the object moved in front of a nearby tree and he realised it was a thistle seed being blown about in the breeze.

When he first saw the object he had no references with which to judge its size, distance or speed, and he had assumed it was a large object at great distance. Had it not been for the fortuitous intervention of a handy ground reference he might have carried his false assumption for ever.

The most famous UFO sighting involving both faulty data gathering and faulty recall was the January-1969 sighting of Jimmy Carter (subsequently U.S. President) in Leary, Georgia. When he wrote his account of the event four years later Carter described the object as about the size of the moon and estimated it to be between 300 and 1,000 yards away. He reported that: "it seemed to move towards us from a distance, stop, move partially away, return, then depart." He reported the object as: "in the west at an elevation of about 30 degrees."

Carter gave the time as 7.15 pm. He could not recall the exact date but estimated it to be October 1969. This placed the sighting firmly in the "unidentified" basket because investigators could not come up with a convincing ordinary explanation.

However, some subsequent sleuthing by UFO sceptic Robert Sheaffer (see his book **The UFO Verdict,** 1981) revealed that Carter's recall of the date had been extremely faulty. The actual date turned out to be January 6, 1969. At 7.15 pm on that date Venus was in exactly the position Carter identified. It was about an hour and a half after sunset, Venus was nearing its maximum brilliance and would have been a very conspicuous brilliant object. Weather records showed that the weather was cold and clear with a few scattered clouds, ideal conditions for Venus to be misperceived as an abnormally large, brilliantly lit, moving and disappearing flying object.

In the UFO studies' literature Venus is identified as the most common object responsible for UFO reports. In Hendry's study, 25 per cent of the solved cases were misperceptions of Venus or simila bright celestial bodies.

The possibility cannot be entirely ruled out that a small residue of UFOs are some extraordinary phenomenon not yet understood. But the odds weigh heavily against it. It is most likely that they are all products of fertile imaginations and human error.

Did the queen transfer herself from one hive to the other? The possibility that she did something extraordinary cannot be completely ruled out, and science, of course, must keep an open mind. But my knowledge of human nature suggests a very ordinary human explanation. My bet is that the beekeeper introduced the queen to the strong hive himself.

He could have done it accidentally because his brain was telling him that that was where he wanted the queen to end up eventually. And he could have done it deliberately because he made an on-the-spot decision to change the planned sequence of events and introduce to the strong hive immediately. He later forgot that he had done it that way.

He might even have introduced the queen to the nucleus, then, at a later date introduced it to the strong hive as planned but forgot that he had made the second move.

As every beekeeper knows, hive work is often fraught with rush and bustle, modified plans, distractions in the form of time constraints, threatening weather, bad-tempered bees, missing or faulty equipment, you name it.

How many beekeepers can honestly say that, without written records, they can remember exactly the sequence of events in a series of apiary visits over several weeks?

Let's have all the facts of this case before we jump to conclusions. Science must keep an open mind, but science must also have hard data. Anecdote is not sufficient.

TELFORD RURAL POLYTECHNIC

By Valerie Bell

Set amidst South Otago's fertile pastures barely an hour south of Dunedin on State Highway 1 Balclutha lies on the banks of the Clutha River. A typical rural town of New Zealand it is the home of our newest polytechnic. Last year the former Telford Farm Training Institute attained Polytechnic status and is now known as Telford Rural Polytechnic.

Originally the home of the pioneer Telford family, Telford Farm has been a landmark in South Otago for over a hundred years. The Telfords' renowned for their Hereford cattle and Romney sheep, bequeathed the 630 hectare property to the nation for the improvement of these two breeds. Over 25 years ago the Trustees of the Estate of William Telford made the property available for the establishment of the Telford Farm Training Institute. In 1963 a Board of Management was constituted by Act of Parliament and the first intake of agricultural students entered in May 1965. The Telford Certificate in Agriculture soon became recognised throughout New Zealand and for twenty years Telford's name was synonomous with agriculture.

In 1984 three apiculture students began a new venture for the Institute: the Certificate in Apiculture Course. Now a polytechic Telford is experiencing strong demand from New Zealand and international students for its apiculture courses. The number of residential Apiculture students has grown to 11, six of them New Zealanders, and five from Papua New Guinea. A New Caledonian will join them in June.

An increasingly familiar sight for southern beekeepers at field days is Telford's apiculture tutor Gavin McKenzie and his students, instantly recognisable because of the Papua New Guineans.

"The training programme for these international students has so far been successful," said Gavin McKenzie. "The students on campus have been extremely hard working and a privilege to teach. Their thirst for knowledge and experience has ensured that they have made the best use of their time in New Zealand, and to be their tutor has been rewarding. I have noted a marked development in their confidence as time passes, confidence which has helped their ability. I am sure they will be an asset to beekeeping in their home countries and will provide leadership and inspiration."

Local and international students study together harmoniously, and seem to benefit from each others' backgrounds. "The students from New Zealand tend to be slightly younger than those from overseas, but each group seems to complement the other," said Gavin.

Students on the 40-week course must complete the 13 modules which make up the theoretical part of the course as well as receiving truition in practical beekeeping. Students at Telford experience the routines found in commercial apiculture enterprises. Feeding bees, hive maintenance and management, queen bee breeding, selection, grafting and introduction, hive manipulations, honey storage, processing and packaging, work planning, and design of work programmes and construction of hive equipment and treatment of timber are all included in the curriculum.

Visits to commercial apiaries, Lincoln College, Invermay Research Centre, and various field days are arranged so students may receive a wider perspective to their studies.

Three of the Papua New Guinea students are taking a shortened three-month version of the course. The curriculum is similar to the forty-week course, but they need complete only four written modules. This practical beekeeping training is similar to the 40-week course but the hive manipulations are more relevant to the tropics.

With many years overseas experience, including commercial honey and queen-bee breeding consultancy work in countries such as Thailand, Papua New Guinea, the Solomon Islands, India, and Western Samoa, Gavin brings a wealth of knowledge and skill to his international students. His knowledge of their local conditions enables him to ensure all training and modules are kept relevant to the tropics.

While in Papua New Guinea, Gavin was Officer in Charge of Apiculture with the Department of Primary Industries, and was involved in the development of hives in smallholder businesses, staff training and selection, and disease monitoring and control. He was also responsible for the development of the processing and marketing infrastructure, bee breeding programmes, and workshop and equipment expansion, including honey extraction and processing and packaging.

Students from PNG prepare a Mu-Mu, a traditional form of cooking a feast in Papua New Guinea.

In New Zealand, Gavin has been an apicultural advisory officer with MAF and has owned a large commercial beekeeping company, so he has vast expertise and experience to pass to his students.

Recently Telford took over the Correspondence Course in Beekeeping previously run by Bay of Plenty Polytechnic. Thirty-seven students were transferred from Bay of Plenty and with subsequent enrolments, there are now 46 studying for the Certificate in Apiculture by correspondence.

"There seems to be a demand for this type of course, where people interested in apiculture may study in their own time and environment" said Gavin. The course is designed as a two-year programme, and consists of 10 written self-contained modules covering such topics as Bee Colony Behaviour, Entomology, Apicultural Botany and Beekeeping Equipment, to name a few. Two two-day short courses are included, covering hive manipulations and queen rearing. Students must attend these two courses to receive practical instruction.

Apiculture students 1991 — Back Row (left to right) Sane Mopafi, Wilson Warlich, George Hamer, Nathan Sofana, Gino de Graaf, Quentin McEldowney, Sven Hasselman, Joachim Waugla. Front Row (left to right) Bill Pintin, Tella Loie, Matthew Laing.

Written modules are completed by the student and returned to Telford for assessment, and practical knowledge is tested by two Oral and Practical examinations, one halfway through the course and another at the end. Local beekeepers selected by the National Beekeepers' Association act as volunteer assessors for this part of the course, so students may be tested an assessor/beekeeper in their own locality.

"The course was developed by the Bay of Plenty Community College in conjunction with the National Beekeepers' Association" said Gavin. "The support of beekeepers who give their time freely to assess students is invaluable. Recently we have contacted the beekeepers involved and the response from them has been terrific. Most are happy to keep supporting the course now that it has been transferred to Telford." With the demand for apicultural training increasing, and such positive support from the industry, Gavin is optimistic that Telford's Apiculture courses will continue to grow and develop.

"Now that Telford has become a polytechnic we are continually seeking to expand and develop the range of courses offered in order to meet the needs of the wider community we are now serving," said Gavin.

Last year, for the first time, Telford offered both Business Practices and Office Practices courses. The initial courses ere well subscribed, and the first students graduated at the end of last year. Enrolments are up for this year, and they look set to become as established as the traditional farm-based courses Telford has offered over the years. Currently staff of the Business Unit are working with the New Zealand Qualifications' Authority to become validated to run a National Certificate in Office Systems which will be offered for the first time next year in Polytechnics throughout New Zealand. It is likely to become the base for qualifications in commercial subjects and will replace most secretarial courses currently offered in New Zealand.

Other discussions with the New Zealand Qualifications Authority, make it likely that soon all courses Telford offers will be validated with this authority. This is a costly exercise, but one which ensures the courses are certain to remain at a high standard.

Not content to sit on its laurels, Telford has recently seen a gap in another area — equine pursuits — and with the blessing of the racing industries, is now offering a Certificate of Equine Studies course. The inaugural course will start on June 10 this year with fourteen places offered initially. With over fifty enquiries received to date the response has been very encouraging. A new riding arena and stable complex has been built, so the facilities available are first class, and with enthusiastic staff and the support from the equine industry, the outlook for this new venture looks bright.

"Here at Telford, we have the space for virtually unlimited growth," said Gavin. "We have a large campus, the envy of city polytechnics, plus 630 hectares of the finest South Otago farmland." Indeed students and visitors alike are usually impressed at their first sight of Telford's campus, with its tall trees, its lawns and well tended gardens. No city campus here, instead students have the peace of the countryside for a tranquil study venue. Visitors and prospective students are welcome any time to look around and may even stay in one of the accommodation units if they would like an extended visit.

Last year Telford celebrated its 25th Jubilee with ex-students, staff, and board members meeting to renew old friendships. No doubt there will be as many challenges for Telford to overcome in the next twenty-five years, as there have been in the past, but with the demand for its courses increasing, this southern polytechnic will continue to offer quality educational opportunities to a wide clientele.

TRIALS AND TRIBULATIONS

By Anon.

In my early days of beekeeping disposing of the crop was no trouble. Each time we went visiting a pot or two of honey went with us. Requests for repeats were often fulfilled, usually as a gift. Supplies ran out anyway after a month or two, so everyone had to wait until the new crop next year.

Increase in hive numbers saw a consequent increase in honey so I decided to go "commercial". Now this placed a new complexion on matters: no longer could freebies be the order of the day, each pot of honey had to show a return. Suddenly, requests for honey from the friends and family diminished in number, and the stock of honey began to mount to a stage where serious consideration had to be given to its disposal.

Visits made to local retail outlets were a disappointment, in that they wanted the locally produced honey but at a price which showed so little return as to be farcical. Supermarkets were only interested if the containers carried the bar code, an undertaking too expensive to contemplate. Disposal by bulk container was also considered, but the packer concerned made it quite plain that one drum was not worth his consideration: unlike Aussie where the packing houses buy honey by the 20-litre pail from small producers, if only to keep it from reaching the retail market.

Where then to dispose of the honey stock?

Brilliant, that was the only word to use to describe the solution. Sell it yourself to the passing public. Living on a major road can have its advantages, and one is that lots of people pass the door daily. So set up a sign, a roadside stall, and go into business.

No sooner said than done. A nicely constructed stall soon appeared at the gate, and signs made it clear that honey was available. Now to sit back and rake in the profit. Day one produced not a single sale, nor did days two and three. From then on the stall had to be run on the honesty system, as I could ill afford the time involved in waiting for customers. Day four saw the sale of a few pots and trade slowly increased, unto the norm for the day was about twenty pots of honey. This was a comfortable level to have, and my stocks of honey were soon exhausted.

On the day I was removing the stall, a car pulled up, and a very dapper chap asked if this was the place he could get honey. Naturally I agreed it was, and offered to get his requirements from the shed. At this his tone changed, and he coldly asked if I was aware that I was breaking so many local by-laws that it was going to be difficult for the local council to decide just how many prosecutions would result from my actions. My surprise was genuine, as was his officiousness. It seems that not only was I operating an unlicenced food business, but selling retail in an industrial area was a further capital crime. Add to that the interruption to the traffic flow on a major highway, and my crimes now had reached such proportions that I must be stopped this instant.

At that I laughed, and pointed out he was too late anyway, the stall was all but demolished, the signs were down, so what was he worried about? It seems that my offer to supply was the trigger needed for him to toss the book at me, and toss it he would, to the full rigour that the law allows. It was at this point that it sank in that this guy was serious, especially as he produced a little book and began to ask for my name and address. In turn, I requested his name, designation, and address, but surprise, surprise! He was reluctant to give forth any information. At this point I decided the charade should end, and promptly retreated within the boundary of my property, pointing out as I did so that he was not welcome until such time as he produced official identification. To say he then exploded would be a slight overstatement. Suffice to say he became incoherent to the point of not being able to speak. A phone call to a crony, employed at the local authority, was most enlightening. He most certainly knew the gent in question, and began the conversation with: "what has he done this time?" It seems that given a little authority, it goes to the head of some people, including the character I had just met. His approach to people had proved to be "unfortunate" according to my mate. The only way he could be handled was by lodging an official complaint. However, since he was already under investigation over two other matters would I be prepared to let time take its course? It might be more prudent, as it appeared I had transgressed the local by-laws in not requesting permission to erect the street stall, and the traffic department were not keen to allow roadside stalls on such a busy road.

Prudence decided his suggestion was the only course to follow. This left me with no outlet for next season, where next? The thinking cap worked overtime for the next few weeks, then a chance remark by a friend germinated an idea. Go into one of the markets which had recently sprung up in the district. A survey of these markets was enlightening. One rented space only, you provided the bench or trestle, and anything else needed. Cost was reasonable at $10.00 a day. Another market provided all the paraphenalia, all you had to do was move in the stock and yourself, cost $25.00 per day. An alternative was to take a permanent stall. Goods could be locked up overnight. That was $45.00 per day but the rental required the stall to be manned all weekend and on public holidays.

This latter was beyond my resources, in both time and stock, so I booked a stall for one day only, to test the market. Now on with the season to hopefully produce enough honey to make it all worthwhile.

The new season started late — doesn't it always? — but enough crop was harvested to go forth and try the market. Sales were slow, to say the least, and I began to wonder if it was such a good idea after all. On top of that there was the curse of having to man the stall for the whole day.

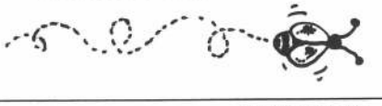
A booking was made for a stall in a month's time. In the meantime the hives began to disgorge sufficient crop to make the winter's effort of building gear worth while.

The advent of the second sale day dawned fine, and I made an early start. Again sales were slow in the morning, but after lunch came a boomer and most of the stock was sold; mainly the smaller sizes, starting at $2.00, but comment received indicated that customers from the first day had finished off their original purchase and wanted more.

With the pattern established, sale day once a month, and a regular clientele building up, everything sweet you think?

The other night at the club I recommended to members that using the markets was a good way to sell their honey. That brought a squark of protest from the back of the room, seems the lady concerned runs a delicatessan shop at one of the markets, sells honey, and is not looking forward to competition.

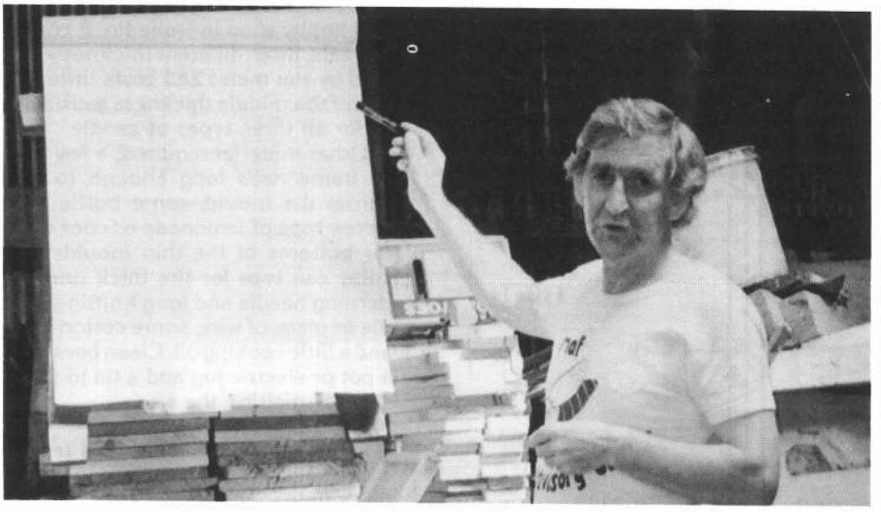
Will it never end?



SOUTHERN NORTH

Above: *Frank Lindsay, Wellington, gives a talk on queen rearing.*
Right: *Gary Rowe demonstrates "propolis for profit".*
Below: *Digging a hole to burn a hive.*

ISLAND'S FIELD DAY



Above: *Ted Roberts explains developments in MAF.*
Below: *The four-man "find-the-queen" triathalon.*

Above: *Ken Richards and Mary Ann Thomasen demonstrate the Cloake method of queen rearing.*
Bottom: **Someone** *can sure hold an audience.*

MOSTLY ABOUT CANDLES

By John Heineman

Winter is here and hopefully your hives are well supplied with stores, secure and safe from the weather and from intruders such as mice, or from disturbance by livestock. As long as a colony contains a large enough cluster to keep warm, has a good queen, has enough food, can stay dry from the weather outside and condensation inside it will survive our coldest winters without having to resort to extra insulation and protection. Moisture is a big enemy. Disturbance by cattle, sheep or humans is an equal danger. Perhaps the beekeeper himself being the biggest culprit sometimes if he or she cannot keep curiosity in check. The less interference the better.

This is not to say that during winter you have to forget about some beekeeping or related activity.

Lately I have had a number of requests from users of our NBA library for information regarding candlemaking. There is not a great deal available on this subject, but I think that the time is ripe to describe a few methods we have tried with good results. I hope it will be of interest to beginners, hobbyists, and others alike. It gives another dimension to beekeeping activities and would also be a good subject for competition such as an extension of the honey sections at shows.

We are of course talking about candles made from bees wax. The common mass-produced candles are usually made from parafin wax which is undoubtedly cheaper. There is something special about using beeswax. The difference between the two is a bit like the plain mass-produced jersey and the hnd-knitted article using home spun wool. We also found that the aroma given off by a burning bees wax candle is much more pleasant than bthe smell of a paraffin wax candle.

THE ROLLED CANDLE.

These are made with a sheet or sheets of comb foundation rolled round a candle wick. The sheet has to be softened enough to prevent it breaking. With imagination and colour sprays very pretty looking things can be created. Straight or tapered, plain or spiraled, short, long, thick or thin, a variety of attractive shapes can be achieved. However there are some drawbacks. Comb foundation does not come cheap. Even with sending up your own wax for conversion into foundation extra cost is involved for conversion and freight. The other disadvantage of this type of candle is that it burns rather fast. Still they look good and the surface pattern of the foundation has a lot to do with that.

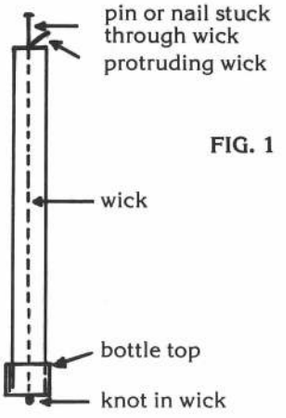


FIG. 1

Moulded candles and dipped candles are more substantial and therefore burn a lot longer and should be cheaper to produce.

The candle from the moulds as we made them differs little in appearance from the common paraffin candles available in shops, while the dipped candle shows a more uneven surface no matter how much care is taken while dipping. However this may not be such a disadvantage as it is a characteristic of many hand-made products and is often appreciated by the public.

HOME MADE MOULDS FOR BEESWAX CANDLES.

While working with our beekeeper friends in the Cook Islands the question arose of how to use a relatively small amount of beeswax surplus-to-requirements for comb foundation. 'Candles' was the answer as frequent power cuts occur and also candles are used in churches.

We have found that plastic water pipe (PVC) can be made into moulds for the simple straight, non-fancy, candles. After some trial and error we finished up with a real first class product.

Any plumber will have off-cuts of this plastic rigid water pipe and will likely be happy to either sell it for little or just give it away. The pipe comes in different diameters. We finished up with three difference sizes candles: a slender 17 mm. thick, 21 mm., and 37mm. The first two were made from moulds 200 mm. long, the last from a short stumpy 110 mm. length.

Candlewick was bought from a craft and hobby shop in Dunedin. It comes on reels, three different thicknesses, is sold by the meter and costs little. We found the middle thickness satisfactory for all three types of candle.

Other material required: a few pins or frame nails long enough to rest across the mould, some bottle tops (screw tops of lemonade or coca cola) for bottoms of the thin moulds and spray can tops for the thick ones. A darning needle and long knitting needle or piece of wire, some cotton wool and a little cooking oil. Clean bees wax, a pot or electric jug and a tin to fit inside for melting the wax.

Making the moulds.

Cut the pipe to the desired length with a hacksaw. Smooth the edges with fine sandpaper. Cut two small V's opposite each other in the top edge. These are for holding the pin or frame nail in place when securing the wick. Drill a small hole through the centre of the bottle top or spray can cap, just large enough for the wick to pass through.

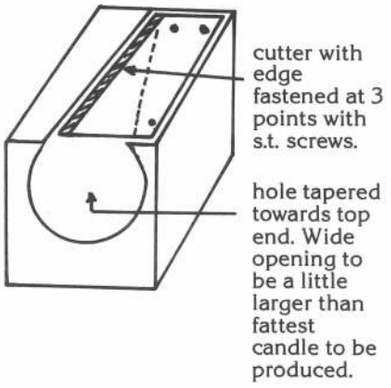
Preparing for pouring the candles.

Melt the bees wax in a tin set inside a pot or jug filled with hot water. Do not melt wax direct on an open flame or an electric element. The wax must be absolutely clean but we found that the colour does not matter much. A very light coloured candle looks good but a darker one burns just as well. The wax should be well melted but does not need to be very hot.

While this is going on prepare the moulds as follows: Clean the pieces of pipe by pulling a clean rag through them. Take a wad of cotton wool soaked in a bit of cooking oil (just greasy, not dripping) and work this through each mould with the help of the knitting needle or wire so that the inside becomes greasy. If this is not done you will find it difficult to get the candle out, the candle surface will be rough, and a slight layer of wax will adhere to the inside of the mould which will get worse with subsequent pourings.

Now thread a length of wick through the darning needle after making a knot close to its end. Poke the needle through the hole in the bottle top and pull the wick through till it stops against the knot. Hold the mould upside down, drop the needle through with the wick attached, turn over and pull tight so that the bottle top sits firmly over the bottom end. Take the pin or frame nail and prick it through the

FIG. 2



centre of the wick so that it rests firmly into the V cuts on top of the mould. Make sure the wick is centred and then snip the wick off a little above the pin. Fig. 1 shows what it should look like. Place the moulds on a firm surface ie. a bench or table with a sheet of paper under to catch any spillage. Support them well so that they will not topple over.

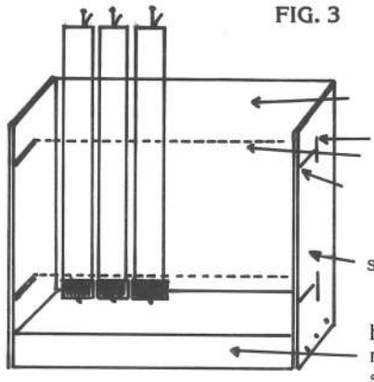
Pouring the wax.

It is a good idea to squeeze the top edge of the tin in such a way that it has a kind of "spout", this facilitates pouring. First pour a little wax into the mould and wait a few seconds before pouring more. The small amount will cool quickly and seal the bottle top to the bottom edge of the tube. Proceed with filling the mould. It will start cooling soon and while this happens the liquid wax will contract somewhat and a hollow will appear at the top of the mould, usually in the centre round the wick. Before the wax solidifies properly, carefully pour in a little more wax till the mould is really full to the brim. Cooling should be a fairly slow process, otherwise cracks may appear. Best to arrange some cover, newspaper or a cardboard box make good insulation. After allowing plenty of time for the candles to harden first cut off the knot under the bottle top and remove the top, pull out the pin or nail and then with some pressure applied to the bottom of the candle it will slip easily from the mould. Wipe it with a clean cloth so as to remove any traces of the vegetable oil which may have stuck to the candle's surface.

The finishing touch.

To improve the look of the candle and also to make it easier to light for the first time, it should be tapered at the top nearly down to the wick. Using a knife is simple, however we found that a "giant pencil sharpener" we made from a small block of wood (50x50 mm. about 60 mm. long), a piece of mild steel and 3 S.t. screws makes for a very neat result indeed. FIG. 2 is self explanatory. The cutting edge does not need to be very sharp. Will do your candles from the fattest down to the thinner ones.

FIG. 3



A base to hold the moulds.

As mentioned before it is important to support the moulds when filling them with wax and of course to keep them in an upright position while the candles set. After trying several makeshift systems, including a box filled with sand we made the gadget as pictured in fig. 3. Nothing else but some scraps are needed. The saw cuts are wide enough to let the elastic slide in easily. The lastic should be somewhat shorter than the length of the base so as to have some tension on to the moulds. For toggles nails can be used. The ply used for the sides has the advantage that it does not split off as quickly as unlaminated boards are likely to do.

DIPPING CANDLES. (ref. Beelines no. 32, Aug. 1987 by Andrew Matheson).

Material required: 1. candlewick; 2. container for bees wax (1¼ ltr. apple juice tin or larger); 3. a large pot to act as a double boiler; 4. a large container for cold water (plastic bucket).

Lengths of wick will have to be dipped into molten bees wax and into cold water. Make three pieces of equipment: A. A handle to attach the top ends of the wick to, B. a hanger to hold this handle if you have to stop the operation for some reason, C. a piece of steel rod or heavy wire as a weight to hang from the bottom ends of the wicks. (see sketch).

The operation:

1. Dip the wicks after they have been tied to handle and weight into the molten wax and hold it there for ½ min. for saturation.

2. Plunge them now into the cold water and pull up without delay.

3. Dip again into wax and withdraw quickly.

4. Back into the cold water. Repeat three and four several times till the candles have acquired the desired thickness.

5. Now replace the dipper on the stand and cut off the wicks where tied to the rod and trim the bottom ends of the candles neatly.

6. Once more into the wax and cold water to achieve a nice shape of the bottom ends.

7. Let the candles cool for a short while and cut the wicks about one cm. above the tops of the candles.

Some hints:

Small flakes of wax will appear on the surface of the cold water. It is advisable to sieve these off after doing a set of candles and before starting the next lot as they may cause roughness.

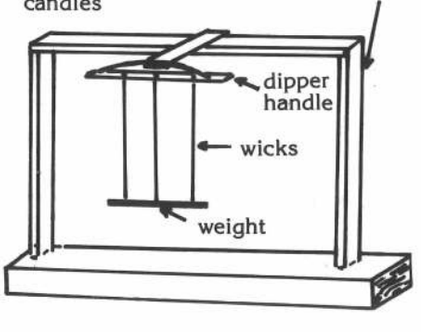
Water drops on the candles surface may cause bubbles. These can be simply wiped away with your fingers.

The bees wax should of course be liquid but not really hot, just so that it does not congeal against the side of the tin.

Always play it safe. Wax is inflammable, use a double boiler, no open flame indoors, keep an eye on things, never leave melting wax alone and know how to call the fire brigade in a hurry. Keeping a fire extinguisher handy is good policy.

FIG. 4

stand for holding dipper handle and candles



South Canterbury

The prospects in early December for an excellent honey crop were quickly blown away by hot nor'west winds. Crops around South Canterbury are generally disappointing and range between below average to average, with no big crops reported, although we seem to have fared better than some other areas further south.

The AGM was held recently with all office bearers returned unopposed.

Branch interest in this year's Conference is higher than normal, so watch out for a few live-wires from South Canterbury in Blenheim in July.

Peter Smyth

Canterbury

Both rain and temperatures have tumbled in the past three days. The Indian Summer is over. Don't put away that machinery until you are sure it's 100% right for next season. Maintenance is cheaper than down time when you are busy.

Canterbury had a crop of around a tonne per hundred. Slightly up on average although some pockets were disasterous.

Prices don't look encouraging. The strengthening US dollar has made sales in Europe difficult, the Canadians being our main competitors. Local producers may need to commit some of their product for export to relieve the local market, currently under considerable downwards pressure with at least one special being offered at $1.85 for 500gms last month. Honey generally is under pressure from other spreads, like Australian jams. Some producers have noticed reduced sales in the first quarter. However these sales can be difficult to assess acurately in isolation.

Honey dew sales began at record levels but since February demand and prices have fallen sharply. Europe is moving into summer and so consumption will naturally fall when the new local production becomes available. Germany has recently bought substantial quantities of dew from Greece, Spain, and some East European countries. They know their products well and prefer it to New Zealand dew which has traditionally been used as an extender.

However production this autumn has been badly affected by a lack of the hot, nor'west weather and too much rain, so there will probably be a limited quantity only for sale.

Hopefully the German mark will stop rising the way it has been during the past six weeks and the small quantities of dew available will return some realistic prices to producers.

David Penrose

Bay of Plenty

Time is running away and winter is on our doorstep. Last minute preparations for readying the hives for winter are just about over.

The Bay held its Branch Field Day in March at Norm and Mary Deans' place. Another splendid day weatherwise and an intensive programme during which everyone enjoyed themselves. Thanks again to Chelsea Sugar who sponsored the Day.

With our AGM set for April 15 the Branch is looking forward to tackling the important issues for the coming year. At its last meeting the Branch welcomed Cliff Van Eaton, our new AAO for the Bay of Plenty. He outlined his concern for disease in the area. The Branch again stressed its opposition to the feeding of drugs to control disease.

Enjoy the quieter months of the year and ponder those plans for next season.

Karl Christophersen

Waikato

The season has now finished and to say the least it has been, as far as honey production is concerned, a patchy one. Reports indicate that while white honey production is not up to expectations, the darker honeys are in rather better supply.

One very pleasing aspect of this year is that wasp numbers are way down. What can this be attributed to? My advisers put it down to the exceptional rainfall in February, or could it be that the wasps have run out of food?

Waikato's Field Day was again held at Tony and Jane Lorimer's property and this year stretched over three days. To assist these two most generous people a small group of Waikato members assembled at Tony and Jane's on Friday afternoon to help get the property ready. Grass was mowed, honey house swept and polished, and all those small jobs so necessary before a field day were attended to. The workers were rewarded by a barbecue in the evening.

A fresh feature this year was the number of Waikato members who camped that night at Tony and Jane's. Interesting are the tales of early morning rising and breakfasts, or lack thereof.

Saturday dawned brilliantly fine and a good muster of Waikato members were ably supported by our friends from Bay of Plenty and Auckland. It was great to see our National president Dudley Ward and his wife heather who had driven up from Dannevirke. Dudley was ably supported by two executive members, of Keith Heron from Gore, and Gerrard Martin our local man. Our thanks to you all.

The National President addressed the Field Day on where the NBA was heading. This talk sparked a large number of questions with a great deal of discussion. Dudley was followed by Murray Reid whose topic was MAF's role should the industry fail to support the present legislations on levies currently before the House of Representatives. Then it was Mark Goodwin's turn to let the meeting know what he was doing with research on American Foul Brood. As with Dudley's talk the addresses by both MAF officers provoked some lively hard hitting talk on these vexious issues. That can only be good for our industry.

Ross Blackman

Southern North Island

I have just spent the day at our Branch AGM in Wanganui, taking advantage of the occasion to listen to the cares of my fellow beekeepers.

We all face the prospect of paying out an added amount for a national disease control programme.

Ted Roberts our AAO and Dudley Ward, national president, were present to update us on the options for funding this disease control programme.

Another concern for some is that we do not get a fair and profitable return for our honey, that the market place is more cruel than kind in its rewards for all our hard work.

While some of us grumble about prices and our poor crop this season, at the same time there is a lot of thinking going on about how to better promote honey locally and overseas.

It was all action at our well attended Autumn Field Day at Inglewood, thanks to our hosts Ken Richards and Mary-Anne Thomason. Main topics were queen rearing and propolis production and some energetic team games. Our thanks also to Chris Bromell who has now stepped down as Branch President after three years in office.

John Brandon was elected to that office, with Sue Walker remaining as secretary.

John Brandon

Nelson

Daylight saving has ended for another year, but the good weather has continued. Not that the bees will get much unless some honey dew is handy. As usual rob is the job if given half the chance.

This year wasps have been almost non-existant in what last year were real hot spots. A number of people, including myself, who are usually asked to

destroy nests have not been called upon this year.

Some of our branch members attended the West Coast Field Day at Dobson on the weekend ending March 10. An excellent and fine day, although I think the organisers had not made it clear that it was a two or three-day event. The amount of food offered was an example of West Coast hospitality. Thank you very much.

Nelson is now mainly a horticultural area so beekeeping here is mainly pollination. With the constant shifting of hives it means we don't harvest much nectar.

The disease inspection mentioned in the summer issue of the NZBK did not take place for some reason. Summer has now come to an end and the little pice of autumn made us smile. The weather forecast said snow down to 1,000 metres with frosts in some places. Look out kiwifruit! People will do well to pray for cloud, rain, wind, anything but frost.

Ron Stratford

Hawkes Bay

The promising early spring flow died off as the inevitable summer drought with drying winds took its toll. Some keepers had a good season but many are still looking for that bumper crop.

The February Field Day at the Dobson's Bee Farm was of great interest to all including visitors from Fielding and Hamilton. One of the strengths of the Hawkes Bay branch is the continuing participation of busy commercial keepers who always seem to find time to encourage the hobbyists. Thanks again.

As promised there was a field day at the branch apiary in March. The usual stalwarts turned out augmented by several new members. The hives were tidied up for the winter and a little honey taken off. It was hands on again for the new members when a hive which had been knocked over was put right. Hopefully the stakes and ties will keep it up.

If you want a well attended AGM invite the President of the NBA, invite the ladies, have a good venue and a pleasant supper to follow. I'm not sure what it was; but a good crowd turned out on a foul night to hear. Dudley Ward explains the current situation with NBA funding negotiations and the disease control problem.

Regrettably Gordon Sutton had to stand down as Secretary but President Bob Wetherspoon will continue to inspire. The elected committee is:

President: Bob Wetherspoon
Vice President: John Dobson
Secretary: Ron Morison
Members: Messrs I. Berry, W. Eddy, C. Gear, G. Sutton, W. Watts, I. Withers, Mrs J. Dobson (Buzz Editor) and Miss L. Sutton
Associate Members: Messrs E. Roberts and M. Taylor.

Ron Morison

Westland

The poor weather during November-December continued right through January-February, frustrating the beekeepers of central Westland due to the fact that some rata showed up this year. As the end of February approached the crop appeared to be over. But March turned on some fine weather and the bees managed to grab the last of the late rata flow, lifting the crop to near average. Southern areas however, saw no rata and so finished with below average crops.

The Branch held an Autumn Field Day mid-March at Lindsay Feary's Honey House. It was pleasing to see it well-attended with visitors from as far away as Nelson, Blenheim, and Canterbury present. The weather treated us kindly with one of the best days this summer. The theme of the day was 'Wintering', and topics covered ranged from Bee Diseases and Pollen Requirements, addressed by Steven Ogden (Invermay) to Quality Queens, by Reg Clarke, and Hive Preparation for Winter, by Gavin White.

The Branch took the opportunity to present Branch Life Membership to Keith Detlaff, a long time member from Ross, who has recently retired from beekeeping.

RESULTS OF ANOTHER DEPRESSION

On August 15, 1882, Firth's little steamer took a cargo of bees, together with Thames bee expert Isaac Hopkins to his vast estate near the head of the Thames Valley in the Matamata area.

He had under his care, "a large number of colonies of bees, many of which are Ligurian, and all the necessary appliances for conducting the bee industry on a large scale" at Matamata. On the way the Kotuku called at Turua sawmills, and took on board "several hundred Langstroth hives."

With Hopkins knowing just what to do to keep bees quiet, captain and crew had a peaceful passage.

Josiah Clifton Firth was delighted. He was not only going to get tons of honey, but also had the right kind of bees for his red clover. Ordinary "black bees" of the time did not have long enough tongues. Bumble bees did, but they were few, did not give honey, and were inclined to take short cuts by biting the bases of the florets.

The Italian bees from Luguria, the kind we see around now, would descend on vast fields of red clover in vast numbers, get those tons of honey, and also fertilise the clover so Firth could sell bushel of red clover seed, as well as the honey. What happened?

The intensifying Long Depression choked off many promising enterprises.

John Heineman

The Branch extends its thanks to all who participated in making the day successful. Also, to Lindsay and Daphne Feary for their hospitality.

Sandy Richardson

Otago

As reported in early January the latter part of 1990 was far from good weather-wise and that cold and changeable pattern persisted throughout January and early February. The autumn has given us many fine warm days, very pleasant but colonies have consequently consumed a considerable amount of the little they were able to gather. Surplus honey available to the beekeeper looks to be somewhere near the 1½ tonnes per 100 overall in the province with Central Otago probably below that figure. Frustrating and depressing. For most of us it will mean further belt tightening, but there is a limit to that too. Just hang on boys and keep a smile on your faces. Next year must be better.

Branch activities have been on the back burner since before Christmas. AGM this Friday evening, April 12 and no doubt we will get busy again.

John Heineman

Marlborough

We are winding up a good harvest. A report to the local radio station about our above average crop was greeted by a reaction that its not news if its not bad. So much for our diet of doom and gloom.*

The committee organising conference has things under control. The wine trail may need checking again to make sure its up to scratch.

Remits are next on the agenda. I've been thinking about our innovative marketing scene. We could have a Wooden Spoon award for the beekeeping or honey packing business that does the best job of dropping the income of the Nation's beekeepers. To the uninitiated this is usually done by a price-cutting exercise with the excuse of market share most often given. On a bigger scale, raiding ones competitors overseas market with a big price discount usually stuffs the market for both of you; a good points earner. This competition could be run on a branch level with the branch winners going forward to a national final in the same way that the Beekeeper of the Year award is proposed. There may be a small problem in getting entries for this competition as suitable competitors may be too bashful.

Hope to see you at Conference, have a restful winter.

James Jenkins

***Editors note.** Precisely. A leading newspaper proprietor once said: "When someone picks up one of my papers I want him to exclaim 'Oh, my God!' ".

North Otago

It was all there for coastal N.O. clover all around, but the weather confounded us, cold southwesterlies continuously.

Just one week of fine weather would have changed the result: 1-2½ ton the norm. But some beekeepers are saying maybe it should have been left on as hives are light in some areas.

About all we can look forward to is Conference in Blenheim. Is honey sweeter than wine? Maybe will need to send along some of our wine buffs to find out.

G.R. McCallum

Southland

It seems that every time I write a report to the NZ Beekeeper it's raining, blowing a cold wind from the South and fresh snow sits on the hills. That seems to have been the weather pattern this season in Southland. March was the exception with warm sunny weather and no wind. Ideal beekeeping weather except it was just too late to be of any real benefit. In actual fact it stimulated brood in some hives using precious winter stores and excessive robbing was the order of the day.

Because of another poor season the second in a row, sugar feeding is unaffordable and will result in the loss of some hives which will affect production next season.

The downturn in production and sales has affected both part-time and full-time workers causing loss of jobs. The short-term prospects for beekeeping are not good with some beekeepers looking very hard at their operations. In the extreme case we will see the end to commercial beekeeping with hives owned and operated by part-timers and hobbyists, and honey being imported to ease local demand. Let us hope that the leaders of our industry will recognise the problems and make the correcct decisions that are vital for the future of beekeeping in New Zealand.

Alister Lee

LIBRARY NOTES

Another huge parcel arrived. Colin Rope, well known Auckland retired AAO, former honey grader, and NBA Life Member passed on the goodies to the library. Thank you ever so much Colin. Some of his books we already have but an extra copy does no harm. These are not listed here but write the following into your catalogue copy.

Books.

Blake S.T. & Roff C. — THE HONEY FLORA OF S.E. QUEENSLAND. 1958, 199p, Austr.

Gojmerac W.L. — BEES, BEEKEEPING, HONEY AND POLLINATION. 1979, 192p, USA.

Gooderham C.B. — BEES AND HOW TO KEEP THEM. 1953, 60p, Can.

Killon C.R. — HONEY IN THE COMB. 1951, 108p, USA.

McGregor S.E. — INSECT POLLINATION OF CULTIVATED CROP PLANTS. 1976, 411p, USA.

White W.J. & oth. — COMPOSITION OF AMERICAN HONEYS. 1962, 124p, USA.

Booklets, papers, articles.

Apimondia — CONTROLLED MATING OF HONEY BEES. 1972.

Dept. Trade & Ind. — HONEY BUYERS GUIDE, 1965, 13p, Austr.

Fell D. & Morse A. — HONEY DEW, 1977, USA.

Fulmer E.I. & oth. — STUDIES ON THE CONTROL OF GRANULATION OF IOWA HONEYS. 1934, USA.

Gary N.E. — MAINTENANCE OF ISOLATED QUEEN BEES UNDER LABORATORY CONDITIONS. 1966, USA.

Goebel R. — HONEY BEES FOR POLLINATION. 1984, 5p, Austr.

Harp E.R. — A METHOD OF HOLDING LARGE NUMBERS OF HONEY BEE QUEENS IN LAYING CONDITION. 1969, USA.

Haseman L. — HOW LONG CAN SPORES OF AMERICAN FOULBROOD LIVE? 1961, USA.

Holzerberlein J.W. — WHEN IS A BEE LOCATION OVERSTOCKED? 1953, USA.

Langridge D.F. — AN INVESTIGATION INTO SOME QUALITY ASPECTS OF VICTORIAN HONEY. 1966, 20p, Austr.

Reid G.M. — NEW IDEAS IN HONEY PROCESSING. 1975, NZ.

Rope C.G. — COLLECTION OF ADDRESSES AND ARTICLES. NZ.

Rope C.G. & oth. — FEASABILITY STUDIES FOR HONEY PRODUCTION ON GR. BARRIER IS. AND OTHER HAURAKI GULF ISLANDS. 1985, NZ.

Townsend G.F. — THE COMMERCIAL HONEY HOUSE. 1976, USA.

Turkot V.A. & oth. — A CONTINUOUS PROCESS FOR DEHYDRATING HONEY. 1963, USA.

Miscellaneous.

A number of copies of early NZ Beekeeping magazines: THE APIARIEST, N.Z. HONEY BEE and N.Z. BEEKEEPERS JOURNAL, 1913-1938, filling in some of the gaps in our collection.

Dept. of Ag. — NINTH ANNUAL REPORT 1901, some pages on beekeeping. NZ (hist. value).

Dept. of Ag. W. Aust. — APICULTURE IN WESTERN AUSTRALIA, Vol. 1, 2 and 3 no. 1, 2, 3. 1964-70, Austr.

Dr Eva Crane's book (project 1990) has still not arrived. IBRA informed us (with apologies) about delay with dispatch; and surface mail takes a long time.

John Heineman

CLEANING UP THE PLANET MIGHT COST THE EARTH

The cost of complying with tighter environmental controls rises in almost inverse proportion to their potential health benefits. Yet, as Forbes magazine reports, regulators are being swayed by arguments that are often based on emotion or misleading information.

Few people reacted as hysterically to the baseless scare over health risks associated with the Alar fruit growth hormone as those who were afraid to pour apple juice down their drains. But in a way the foolishness of a few symbolises America's environmentalism: an emotional reaction that is based on misinformation, disinformation and the faulty use of statistics.

Earth Day was held last Sunday, and the self-appointed guardians of Mother Earth are now riding high. Professional and semi-professional environmental activists have learned to dominate media coverage. The US Congress is in a mood to indulge in the political equivalent of not pouring apple juice down the sink.

Over the next few months Congress may pass amendments to the Clean Air Act that will force America to go to expensive extremes in an effort to control smog and acid rain. The most responsible economic estimates of the costs of that legislation are $US23-45 billion a year, all of which must be paid in one way or another by US consumers or taxpayers. This would be on top of current pollution control costs estimated at $US81 billion a year.

We know of no one who would begrudge 2% of US gross national product or even more on the environment if the money were well spent. There is evidence, however, that much of it will be wasted. Almost in proportion as these costs have climbed, the potential health benefits from additional environmental controls have declined, as one after another of the major "hazards" of the 1970s turns out to have been a false alarm or a severe exaggeration. Alar in apples is the least of it.

In 1976 Samuel Epstein, the formidable environmental health alarmist, told a congressional panel that 20% of Americans were dying in "an epidemic of cancer" and that 70-90% of human cancers were environmentally induced.

This sort of testimony garners headlines and votes on Capitol Hill. Never mind that his analysis was based entirely on hypothetical "risk models" that extrapolated large estimates of deaths from small pieces of evidence.

As those risk estimates accumulated, they began to predict far more cancer than the nation was actually experiencing. This promoted Congress's Office of Technology Assessment to commission a study by Sir Richard Doll and Richard Peto, two renowned Oxford epidemiologists. In 1981 they concluded that pollution accounted for only 2% of cancers, not the 70% that Epstein found. By contrast, smoking, diet and other lifestyle choices accounted for 75%.

Consumers barraged by news reports that such-and-such chemical or pollutant "is killing X thousands of Americans every year" may find this hard to believe, but when epidemiologists went looking for those "70-90%" of cancer deaths caused by the environment, at least 97% of them were nowhere to be found.

In 1986 the US National Cancer Institute confirmed much of what Doll and Peto reported. It said the best way to cust US cancer levels in half by the year 2000 was to focus primarily on smoking, diet and sexual behaviour. But it is a lot easier for a congressman to get on television and rail against a chemical company than to preach that Americans should live cleaner, more abstemious lives. Hence the US has such legislative consequences as the Delaney clause of the Food, Drug and Cosmetic Act, banning the slightest trace of chemical carcinogens from food processing.

The problem is not that the US is making too great an effort to make the environment cleaner or our lives safer. Those are worthwhile goals. For all its immense benefits, industrialisation brings with it risks, which need attention. The trouble is that the wrong efforts are being made, with results all too often the opposite of what is intended.

Take the banning of Alar. Paradoxically, the ban may increase the risk of cancer. Why? Alar, a growth hormone, strengthens the bond between the apple and the tree, making the fruit less susceptible to leaf miners. Alar's use obviates the need for much harsher insecticides, whose cancer risk theoretically is much greater.

Examples of environmental regulations that have produced the opposite result to what was intended can be seen all over the regulatory landscape. In pursuit of the impossible goal of eliminating all risk, the regulations ignore side-effects of the regulations themselves that can be more dangerous than the preceived original risk. The banning of the fungicide ethylene dibromide from most food processing in 1983 probably raised cancer rates: Fungi produce powerful carcinogens, and replacement fungicides carry their own, not fully explored, cancer risks.

This February, the US branch of Perrier recalled 72 million bottles after a North Carolina county laboratory found samples of Perrier water containing 19 parts per billion of benzene, a known carcinogen.

Although North Carolina health officials did not think this risk sufficient to warrant recall, they insisted on issuing a health advisory. With the repercussions of the 1989 Alar crisis still reverberating through the food industry, Perrier had no choice but to recall the product. In the course of doing so, the company admitted the benzene was a natural ingredient of the carbine dioxide gas that bubbles up beneath its springs in Vergeze, France.

For nearly a century, Perrier has filtered the gas to remove the benzene before mixing it with the water. Benzene levels rose because filters had not been changed often enough.

Is unfiltered Perrier dangerous? It all depends on your perceptions. David Gaylor, head of biometry at the National Centre for Toxicological Research in Jefferson, Arkansas, estimates the additional cancer risk of lifetime exposure to a one-litre bottle of the contaminated Perrier every day for 70 years to be somewhere between one in 100,000 and one in 10 million. Thus, if every American were to drink a litre of Perrier every day from birth to death, there might — might — be a couple of hundred extra deaths a year if Perrier's filters were not changed. Of course, the spings of Perrier would have long gone dry under all that consumption.

That such minuscule risks can be de-

tected is something quite new. It seems that now society is getting two skilled at anakytical chemistry for its own good — at least if people want to continue living the Delaney clause illusion of zero risk. "Fifteen years ago we couldn't even detect 35 parts per billion," says Gaylor's boss, Ronald Hart, the director of the toxic research centre. "Now we identify one part per quintillion. That's almost the equivalent of filling the entire Great Lakes with gin and putting a single tablespoon of vermouth in it. That I think you would agree would be a pretty dry martini."

Unfortunately, in today's emotion-charged media climate Perrier could not afford to have such arcane mathematics debated on TV. So $US40 million worth of harmless product was added to landfills. Thus did Perrier become the perfect paradigm of the hypochondria that now grips an affluent society frightened by shadows on the wall. Paul Slovic, a psychologist at the University of Oregon who specialised in risk perception, says: "The more the nation spends on regulation, no matter how many billions are spent, the less safe the American public seems to feel."

The new Clean Air Act will force the expenditure of up to $US50 billion a year on pollution control. This amounts to 30 times the entire $US1.7-billion budget of the National Cancer Institute. The maximum health risk target identified by the EPA within the Clean Air Bill is 2700 deaths a year, and that figure is based on models that almost certainly exaggerate.

That is a cost of about $US16 million per life that might possibly be saved, whereas we spend only about $US4500 per life that might be saved from other causes — alcoholism and drug abuse, for example, which kill 380,000 Americans every year. The saving of lives is worth spending money on, but it doesn't make much sense to spend vast amounts in the hope of saving a relative few when we cannot seem to afford to spend anything like those amounts on things that cause hundreds of times more deaths.

The problem is that deaths from causes such as alcoholism or overeating rarely make the six o'clock news, while any cancer scare, no matter how pumped up, seems to do so. It is not hard to pump up the numbers. Dr Vernon Houk, director of environmental health at the Centre for Disease Control, says: "The effect of EPA's exaggerated risk models is very often to force massive expenditure of money on minuscule risks. I would cann that not conservative but very radical."

If the people want sweeter-smelling air, so be it. But they won't necessarily get longer life spans from the Clean Air amendments. In a recent *Regulation* article, economists Wilbur Steger and Frederick Rueter of Carnegie-Mellon University analyse the age-adjusted cancer rates adjacent to and downwind of the big coke ovens of Allegheny County, Pennsylvania, one of the principal targets of the "air toxics" controls. Those rates came out 20—30% below those for the country as a whole. The two professors infer from this — and from expected cancer rates — that the EPA's already low estimate of 6.9 cancer deaths per year nationwide from coke oven emissions is an overestimate of those risks by at least a multiple of 100.

Congress and the EPA are pushing companies to reduce their theoretical emission risks to one per million. But, says Houk: "When we push risk assessment to one per million, we are talking scientific, not to mention economic, non-sense. Do you know what one per million is? It's the risk you take in driving your car 40 miles; taking a commercial jet 2500 miles; canoeing for six minutes."

In the pursuit of such perfection, says the toxic research centre's Ronald Hart, "we are busy tripping over dollars to pick up pennies. For example, we know that diet accounts for about 35% of all cancer deaths, or about 178,000 a year, and perhaps a lot more. Yet the Federal Government now spends less than $US50 million a year on nutrition research, or about $US280 per nutritionally caused death.

"Do we really want to say that the person who dies of cancer from bad nutritional habits is worth $US1000, while the person who dies of air pollution is worth $US30 million or perhaps even a few billion?"

The director of the Office of Management & Budget, Richard Darman, says: "One of the greatest dangers of the 1990s is our scientific capacity to discover and define ever-diminishing levels of risk. This, combined with our society's apparent willingness to place an infinite value on each human life, is bound to lead to investing more and more resources on smaller risks with less and less real return in actual risk reduction or helath improvement."

A case in point: This year American taxpayers will spend more than $US5 billion to remove asbestos from schools and office buildings under a 1987 federal law; the ultimate cost, for fixing 733,000 buildings, could run as high as $US100 billion. Yet scientists are now discovering that removing asbestos often increases risks more than it reduces them.

As with other cancer scares, this one was accompanied by a rish forecast: 67,000 deaths a year from airborne asbestos (Health, Education & Welfare Secretary Joseph Califano, 1978). The forecast proved to be wide of the mark by a factor of 45. In all of the US, there are about 1500 cases per year of mesothelioma, the cancer most associated with asbestos exposure. Of those cases, 80% are among men over the age of 65 who were asbestos workers years ago, and a significant number of those workers were also heavy smokers. Like all other such predictions, the original projection was based on mathetical models, not on human experience or on epidemiology.

Here is another risk model prediction. A billboard near Washington announces: "Radon will kill 20,000 Americans this year." This radon risk is extrapolated from studies of the occupational exposures of 375 uranium miners who died of lung cancer — exposures that are as much as 12,000 times the level found in average US homes and 600 times the level found even in the nation's "hottest" 0.2% of homes.

But this EPA risk model does not sit very well with ecological evidence from the EPA itself. Last October the agency issued a report declaring that Iowa has the highest radon danger risk found so far in the US, with 71% of its homes above the EPA's "warning level" and an average radon exposure seven times that of the nation. Those numbers suggest Iowa should be in a lung cancer death epidemic. Yet Iowa's age-adjusted lung cancer death rate is 12% below the nation's. Could other factors besides age explain Iowa? Perhaps, but a more thorough statistical analysis of 415 US countries turns up no correlation between radon levels and lung cancer rates.

A leading epidemiologist, Yale University's Dr Jan Stolwijk, sums up the situation: "If radon were such a major risk factor it would clearly shine through in the ecological data, but it doesn't. In fact, all the epidemiological studies suggests that without smoking, radon is an unimaginably small public health risk."

Rosalyn Yalow, 1977 Nobel Prize winner in medicine and physiology, points out that virtually all the rise in lung cancer death rates came after cigarette smoking took hold.

The weaknesses in asbestos and radon risk models are mirrored in studies of other poisons, which are generally tested on laboratory rats. This is what toxicologist Hart says about rat experiements: "Our risk models are

based on at least 50 assumptions, none of which has been scientifically demonstrated. For example, we assume that there is no difference between continuous (as in animal tests) or intermittent (as in human experience) dosages. But that ignores our growing knowledge of the way in which DNA repairs the human system."

Hart wonders whether rat-feeding tests pick up cancers that have little to do with the chemical under study. "We feed rodents 'all-you-can-eat' buffets every day, yet we know that caloric intake is the single greatest contributing cause of cancer," he says. "In fact, we found you can modify the cancer-causing impact of one of the most potent carcinogens from 90% down to less than 3%, just by cutting caloric intake 20%."

The rats may be dying from overeating, not from exposure to a specific carcinogen, but the deaths are attributed nonetheless to the carcinogens because that is what the experiments set out to prove. No one really knows how well risks for those rats translate into risks for humans. Last year Vernon Houk of the Centres for Disease Control told as Atlanta environmental symposium: "Risk assessment policy that relies solely on screening bio-assay (animal test) results from the most sensitive species is not based on scientific principles. Neither is it credible or reliable."

Consider how extrapolations affected the Government's response to an environmental crisis in 1982, the pollution of Times Beach, Missouri, by dioxins. Dioxins, contaminants of the Agent Orange herbicide and by-products of many industrial processes, are exquisitely toxic: a diet consisting of less than one part per billion of dioxins would kill a guinea pig. But what if humans are exposed to far, far lower doses? Will they get cancer?

Dioxins are such powerful carcinogens in rodents that even though the highest levels measured in Times beach soil were very low, federal health authorities felt they had no choice but to recommend evacuation of the town. The Government spent $US33 million to buy up houses and resettle residents.

Now, after costly epidemiological studies of individuals exposed to very high levels of dioxin, including victims of a 1976 industrial accident in Italy and the air force fliers who sprayed Agent Orange on Vietnam, scientists are finding no connection between the exposure and cancer rates. The most serious health effect was chloracne, a skin rash.

What happened? Two things. One is that the early studies of dioxin, for both Times Beach residents and Vietnam veterans, greatly overestimated exposures. Whereas the EPA said Vietnam veterans should still have high levels of doxin in their blood, the Centres for Disease Control's blood tests on ground troops showed these levels to be no higher than the average for the US population. Houk found that 40% of the prople classified as having had high exposure in Times Beach actually had low exposure. The other factor seems to be that dioxin is far less carcinogenic in humans than in laboratory rats. "To put it bluntly, we found that human beings were not nearly as susceptible to dioxin as guinea pigs," Houk says.

Rat studies seem sure to doom some vital pesticides. The EPA has the power to ban farm chemicals, which it generally does in spite of the objections of the US Department of Agriculture. The Agriculture Department estimates that 4500 specific applications (to use this chemical on crops) will be lost in the current round of EPA reviews.

'If we applied (the Delaney clause of the Food, Drug and Cosmetic Act) to all food we would never get to die of cancer. We would all starve to death because we would have to ban all the food we now eat'

Sanford Miller

Might this be a pyrrhic victory for the proponents of safety? Just a year ago the National Research Council concluded that one of the best ways to fight cancer and all other chronic diseases was to increase our consumption of fresh fruit and vegetables. Also, the report argued that the benefits of such increased consumption infinitely outweighed the small risks of the chemicals used to produce them. Do we really want to raise the cost of fruit and vegetables? Do we really want to drive farmers away from producing them?

The National Research Council report did not get much attention, though. Three nights before it came out, the Natural Resources Defence Council reached 30 million *60 Minutes* viewers with a report declaring that their children were being poisoned by apples. Enough Alar — Uniroyal Chemical's trade name for daminozide — was used on apples, said the environmental activists, to give cancer to 250—910 children in a million.

Even at the low end, that risk estimate was six times the EPA's. But reporter Ed Bradley did not mention the EPA risk number. Instead, he said that the EPA had told him that if it attempted to ban Alar, Uniroyal would sue.

Cut to Representative Gerry Sikorski (Democrat-Minnesota), declaring: "Let them sue ... then let them go to a cancer ward in any children's hospital in this country. See these bald, wasting-away kids. And then make a decision whether the risks balance over the benefits."

Emotion won over reason. Within hours, apples and apple juice were being dumped across the nation. It was then that some hysterical customers called the EPA to find out if it was safe for the groundwater to pour apple juice down the drain.

Sanford Miller, dean of the Graduate School of Biomedical Science at the University of Texas Health Service Centre; sums up: "The risk of pesticide residues to consumers is effectively zero." This common-sense view, however, is still contravened by the 32-year-old Delaney clause, which outlaws any additive that tests positive for cancer in rodents.

Given the nature of animal tests, it is not surprising that half of all pesticides tested turn out to be carcinogens. Says University of California's Bruce Ames: "99.99% of all pesticide carcinogens now ingested by humans are natural — that is, generated as defence mechanisms within the plants themselves ... When I realised that we were already ingesting 10,000 times as many natural carcinogenic pesticides as synthetic ones, and human health keeps getting better, I began to put the risk into perspective."

Says Snaford Miller: "If we applied Delaney to all food we would never get to die of cancer. We would all starve to death because we would have to ban all the food we now eat."

It was a biased exposure model that underlay last December's decision by the EPA to phase out the use of most ethylene bidithiocarbonates, the most widely used crop insecticides, at a cost in higher prices and lost commodities of more than $US2 billion a year.

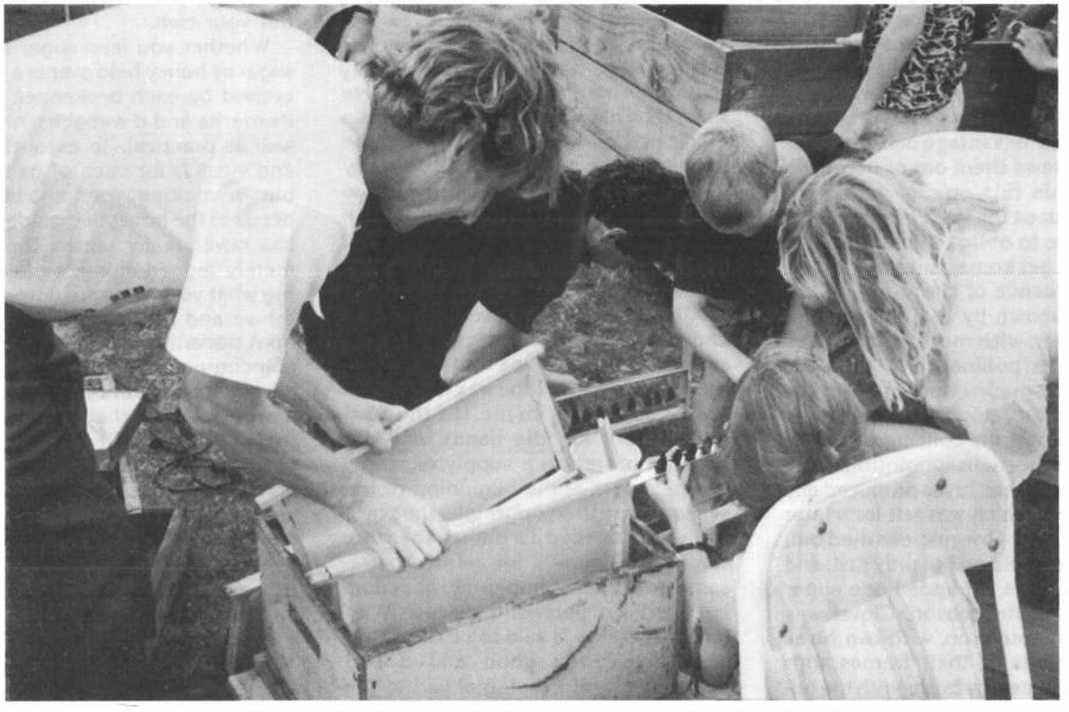
Warren Brookes

Reprinted from **Forbes** the world's leading business magazine.

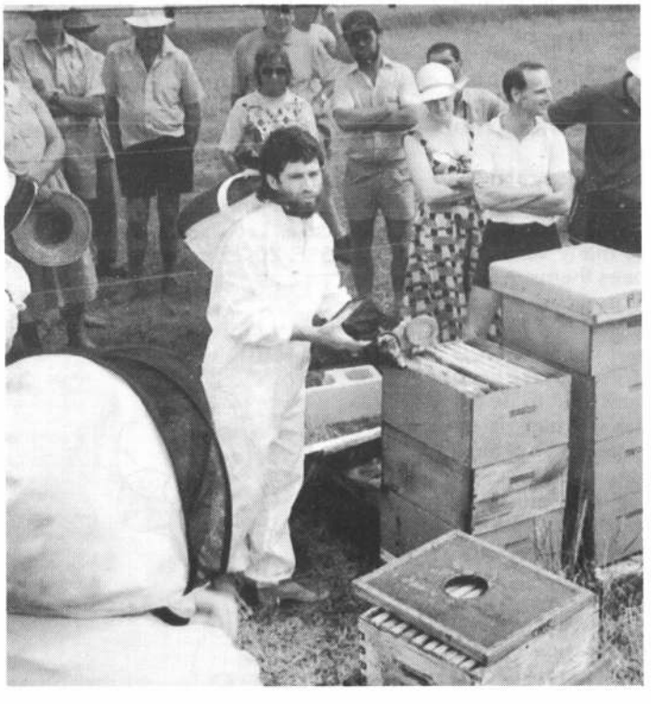
HAWKE'S BAY

Above: *John Dobson demonstrates a mating nuc.*
Right: *Find the queen.*
Bottom: *Jenny Dobson grafting queen cells.*

FIELD DAY



Above: *Ted Roberts in the "assembling queen-breeding hives" competition.*
Right: *Children at the "pot luck" tea.*
Left: *Colin Mclean demonstrates one method of removing honey.*



MAKE SURE YOU GET IT RIGHT

By Ham Maxwell

My most isolated yard is in the hills, in sheep country with some forestry. The gullies are still full of scrub with some bush, but generally the area provides little in the way of nectar. Plenty of pollen though from the gorse, and the bees take advantage of it when the weather allows them out of doors. Of all the yards this one is visited the least, produces the least crop per hive, and is there to oblige the farmer who is trying to get some fruit trees established. Evidence of the worth of the bees was shown by the recent crop: the best ever, with more fruit per tree due to better pollination.

Three new nucleii were put into the yard last season, along with some hives made from swarms collected, but the results have been disappointing. Only the two established hives produced any surplus crop, which was left for winter feed at the yard. One nucleus died out, the other two held on but only just, and the swarm hives expanded one super by the end of the season. Clover was the predominate crop, with two hives filling portions of their frames with manuka from nearby bush. With the onset of the colder, wetter weather, the amount of food storage has been noted, and the last check showed considerable consumption. Additional food in the form of syrup from the rendering of the wax has been given to each hive. As more wax is processed, so additional food will be supplied each week.

In other yards, located in more food-rich areas, each hive was left at the end of the season with a full super of honey. These hives all show ample stores still untouched, especially evident when one yard had to be cleared because of encroaching housing development. Manoeuvering those hives up a steep slope was not the easiest of jobs: the weight of honey was more evident. Some of these hives were as strong as those in the distant yard, yet needed to depend far less upon stored food. To consider supplying these hives with extra food at this stage is out of the question, as many combs show recent uncapped supplies. To enable these hives to last the winter will require a random check only, as pollen supply is plentiful at the moment.

Depredation by wasps has been a concern in some yards, and closing the entrances has helped reduce losses. To be realistic means we must accept some losses, but an active eradication programme in the summertime is paying dividends. In some areas no wasps have been sighted near the hives. The co-operation of nearby property owners has also helped to considerably reduce the number of wasps. They were more than happy to have the wasp nests eradicated, and the brew from the grape harvest of one neighbour will be ready to taste soon. Her wine and my mead will make a heady combination. Queen wasps found in hibernation amid wood piles have been despatched. Imagine, 40,000 at one blow!

All unused supers are removed at the end of the season for cleanup and storage inside over the winter to avoid the depredations of the wax moth. This means extra work for me, but the devil makes work for idle hands, and the benefits of having a supply of ready-to-use supers at the beginning of the season more than outweighs the physical effort needed to gather them in. Coding the supers for return to the same yard helps, hopefully, in reducing the risk of spreading disease. Wintertime activity is said to be the difference between a good and a bad beekeeper, and keeping ahead of the needs of the following season should more than keep me busy. I'll be good, because I've no time to get into trouble. Painting supers is a must for me. Supers cost money and getting the maximum number of seasons from them is common sense. Badly formed combs are melted down in the wax recovery programme, new foundation sheet fitted, ready for the forthcoming season. Propolis gathered when cleaning up combs is stored and will be sent away to raise the income.

To gain something from any activity input is always necessary. Whether your input generates enough output is a moot point. With so many variables: weather, pests, the bees themselves, it is easy to find reasons to excuse the failings which become evident. To help your bees survive over the winter it is more important than ever to take heed of the climate changes said to be occurring. The gradual warming is already evident in the production of blossom on the trees, so our tendency to religiously timetable both ourselves and the bees will need to be altered. Nectar flows may be earlier in some areas, pollination cycles also. The need to be ready for the early changes is now more important than ever. To delay starting winter activity may be foolish, to neglect it entirely disastrous. If you are caught short it will be nobody's fault but your own.

Whether you feed sugar syrup, raw sugar or honey held over is a choice exercised by each beekeeper. Each has its merits and d awbacks, financial as well as practical. To extol the virtues and vices is for each of us to decide, but in making your choice, let the needs of the honeybee guide you. Man has never really tamed the bee, but merely tagged along, so keep watching what your bees are doing. To open a hive and find a heap of bees dead from starvation is a practical statement of incompetence. See that ample supplies of food are available at each hive, devote the time that one extra trip to that outlying yard may require, and be optimistic. Next season is bound to be better than the last because it could not be any worse.

SWEET ROLLS

1 cup milk
¼ cup honey
¼ cup shortening
1 teaspoon salt
2 cakes compressed or dry granular yeast
¼ cut lukewarm water
2 eggs
5 cups flour (about)

• Scald milk. Add honey, shortening, and salt. Soften yeast in lukewarm water and add to milk mixture. Add beaten eggs and half the flour. Beat well. Add rest of flour. Mix well. Knead on a slightly-floured board until smooth. Place in slightly-greased bowl. Cover and let rise until double in bulk. Punch down and form into rolls or coffee cake. Let rise again. Bake at 400-425°F. 20-25 minutes.

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