Beekeeping Notes by Willie Robson January 2010

This is a series of three articles written in response to enquiries from journalists, beekeepers and the general public about beekeeping. It is based on 45 years practical experience of keeping bees for a living, as well as references to knowledge gained by my father, W.S. Robson Snr, who studied and taught beekeeping as a profession.

Throughout these articles assumptions have been made that may not be correct, as one finds in most articles about beekeeping. Neither do we claim that at Chain Bridge Honey Farm we are always as proficient as we might be. There is always room for improvement. Nevertheless, the reader must use their imagination and cross-reference to different parts of the article to pick up on recurring themes. This is a vastly complicated subject and detailed discussions could take up many more pages.

Readers must also accept that I am pointing the finger at no-one, and it is written for the general good of the craft and that current problems have all happened before.[1] I remember my father saying that during the Isle of Wight outbreak (of Acarine and associated diseases) between the wars, fellow beekeepers would not visit each other until they had checked if there were any bees crawling about on the garden path.[2]

[1] Although Varroa has only been present in this country for 20 years, bad and sometimes more virulent diseases have gone before.

[2] Bees were often kept in cottage gardens.

First Article

Beekeeping in Northumberland has gone through difficult times, mainly as a result of bad summers (high rainfall) leading to malnutrition, and varroa, which can be controlled to a degree. Colony collapse disorder does not occur in the North of England or Scotland but is prevalent in America where honeybees come under great commercial pressure. The actual causes of CCD are difficult to determine but a lifetime's experience tells me that bees have lost the will to live as a community. This may be due to a number of causes. As it happens, during the winter, the prevailing weather is obviously a contributor or the last straw.

Continued line breeding obviously weakens them, as it does in all animals, as well as other pressures such as unsuitable transport, the presence of chemicals in the ecosystem and severe commercial pressures, as well as Varroa. To me this all seems very simple. To others who deem themselves experts it is still a mystery demanding a great deal of research. Great efforts are being made to find a suitable cause that can be proven beyond doubt, whereas the real cause is bad husbandry on a grand scale where all the considerations suit the beekeeper and none suits the bees. Honeybees are not machines.

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Second Article

It is important to be reasonably professional when attempting to look after bees. Beginners need to attach themselves to someone with a considerable degree of experience and who has been a successful beekeeper. In this respect it was a retrograde step to do away with the county beekeeping instructors who were employed by the government up until the 1970s and were a link to lessons learnt in the past as well as keeping up to date. And bees do nothing invariably.

Presently the most important thing is never to miss a treatment for Varroa. Once Varroa gets the upper hand the situation is difficult to recover.

A further problem is the great number of bees being imported into the UK from Southern Europe and other places, as they are invariably susceptible to disease. Similarly, variable levels of varroa infestation render the local bees susceptible to the existing diseases to which they were normally resistant. The problems are therefore compounded.

Nosema is a difficult disease to control and since WWII has been a problem in the UK. Nosema has many causes. Some are difficult to determine. Bees detect apprehension and incompetence, which results in bouts of stinging and bad temper. This kind of confrontation results in increased levels of Nosema. Other causes are bad transport, particularly poorly sprung trailers, poor apiary locations (e.g dampness, exposure and altitude), as well as long periods of adverse weather. Increased levels of insulation can help. Crushing bees between the supers is a certain way to get Nosema, as well as any manipulations that cause them great upset. Never terrorise them, especially with smoke. And then there are some colonies that have no resistance to it.

Good apiary locations are critical to the success of a beekeeping enterprise. Bees must be sheltered from the prevailing wind, both in winter and summer. In the winter they must be able to see the sun between 12 noon and 2pm on the shortest day, without any intervening tress and bushes, to allow flight at least once a month and lift morale. It is worth noting that if northern brown bees are in direct sunlight in May and June they are liable to swarm abruptly as they are unable to control the temperature in the brood nest, especially if they are sitting on a stone slab in a walled garden.

It is most important that there is an adequate supply of pollen available for the bees at all times of year. Bees will wear themselves out looking for pollen in the spring if it is too far a distance. This is made worse by mild winters followed by cold springs. Lack of particular pollens, together with bees that are susceptible may well be the cause of the European Foul Brood, which is such a problem throughout the UK.

In order to get through the winter, bees need a honey flow in late August or September to rear healthy young bees to carry the colony through, otherwise the colony will dwindle in the spring. A good spell at the heather would help here and a bad go at the heather always spells trouble (altitude).

When bees are kept in large numbers on a site drifting can be a problem at any time of the year. Bees can drift a mile at the heather. When bees are working a honey flow in late spring during cool weather drifting can be excessive. The colonies that lose bees become demoralized and very often leave the hive altogether, apart from the queen. This is a physical problem, but the colony is often lost.

‘Susceptible’ is a key word in beekeeping. It is practically impossible to keep bees that are susceptible in the UK, where every region has bad weather sooner or later. Inbreeding or line breeding can be a problem in this respect but not always. Bees have to settle down and organise themselves to survive and the beekeeper has to be careful and allow them to do this. Bees must have the will to live and do well. It is worth noting that we occasionally find very strong feral colonies that appear to have survived, although most feral colonies succumb to Varroa.

In conclusion it must be said that Varroa and secondary infections are the principal cause of colony losses in the UK. The Varroa mite reduces the natural immunity of the bees and destroys their morale.

In the USA and other parts of the world industrial beekeeping is practiced and this creates even more problems. We are perhaps fortunate in the North of England that we have never been able to take liberties with the bees because of the harsh climate and thus, we and the bees are more able to cope with adversity. Nevertheless, beekeeping is, and will continue to be, difficult.

Addendum

Defensive behaviour in honeybees is sometimes genetic but more often is a result of continued stand offs with the beekeeper, whereupon the bees become habitually nasty. The bees always come off the worst in such situations surprisingly enough. Bees will become very manageable if they are approached with some consideration and respect, and the work is carried out fluently. It is a matter of judging their mood. And bees can detect the slightest fear. Yellow bees are much easier to handle but don’t live so well in the North.

Drifting occurs in all apiaries. It can influenced by the prevailing wind or large objects, such as house or trees in the flight line. If the direction of the honey flow is to onw side or behind the hives, the bees will make mistakes, and then some go into the wrong hives just to get home, especially if it is a big one. There is security in a big hive.

Drifting also occurs where colonies are left untreated for Varroa and migrate into hives in another apiary, perhaps a mile away, belonging to a different person. This can come as a nasty shock to a careful beekeepers.

Drifting can make poor queens look good and vice versa and lead the beekeeper into erroneous conclusions (Nutrition). It will cause colonies to swarm prematurely. Beekeepers should not share apiaries.

When queens are bought in from abroad, not only does one buy the useful qualities of that breed but also the drawbacks that are often overlooked. For bees to do well in this country, especially Scotland, disease resistance, longevity and thrift are of paramount importance.

When bees of a foreign persuasion find themselves in the UK and come upon a prolonged period of very poor weather, they become demoralised and open to all types of disease including EFB, which I believe to be endemic. Disease knows no boundaries. These imported bees have 10 years in which to acquire immunity and acclimatise themselves or die out.

When I think back to the situation in the 1950s, most of the bees were of a dark brown type supposedly Dutch skep bees that were resistant to the Isle of Wight disease. There was a great upsurge in beekeeping activity in the 1950s as a result of a general shortage of food and the need to supplement very low wages. Honey farms were started all over the country.

Italian bees were imported to make up the numbers, much the same situation today. Unfortunately the Italian bees were difficult to winter without them getting dysentery which rendered the hives useless for another year until they could be sterilised. Honey farms were often closed down because of these problems. The Italian queens mated with the local bees and the first crosses were exceptionally aggressive, which put an end to village beekeeping.

Previously bees were kept in village gardens and were used to seeing people and children and dogs and so didn't sting them very often.

We can sometimes see the descendants of those Italian bees in our colonies today, as their genes would work their way right through the local population. Occasionally one comes across jet black bees which may be throw backs to the indigenous race. There were 50 hives within the boundaries of Horncliffe, a village with 200 people. There were 200 hives belonging to mill workers surrounding the village of Cumledge. At that time agriculture was totally dependent on indigenous wild white clover to provide nitrogen. I stress the word indigenous as the clover today doesn't seem to yield as profusely as the old wild white.

So the bees had the sycamore, the gean, the hawthorn and the charlock in the cornfields as there were no sprays, then the clover. Finally a short journey took them to the heather. Thus there would be no malnutrition in a reasonable year and the colonies would be small and resistant to EFB and other disease in all but the very worst season, and even then it would go unnoticed.

I would guess that 80 % of the success of beekeeping would be **nutrition**. In those days there was adequate nutrition for a very large number of beehives.

Things took a big step back with the introduction of selective herbicide[1] and artificial manure, until the introduction of oil seed rape in the early 1970s. By that time many had packed up beekeeping for good.

There were great numbers of American Italian packages[2] imported after the 1962-3 winter and while we did not see any of these a friend was persuaded to take some to replenish his colonies. Many years later, we were left these bees and as we had helped to look after them in previous years, we knew what to expect. They were down to handfuls in the spring and wouldn't lift their heads in the summer and had become degenerate. The problem was Nosema and once they get that way they are difficult to get going again and never get any honey. I suppose most of them fizzle out in the winter to be replaced by tougher ones.

My father said of those that pegged out in the winter: “Good riddance”. Harsh winters can be a benefit to beekeepers as a means of controlling disease, although this can be hard to take at the time.

[1] The spray that killed thistles killed the clover as well.
[2] A queen in a cage and a box of bees surrounding her.

There were Italian bees and New Zealand bees imported into this locality in the 1980s. Italian drones were seen in hives miles from their apiary. The New Zealand colonies which were situated locally all gave up the ghost within 3 years.

I read in a magazine recently of someone watching bees headed by a New Zealand queen leaving a hive for good in North Devon. I am quite sure that New Zealand bees are very good in their own country but they will not feel at home in North Devon, which is 10 degrees further from the equator and on the other side of the world.

I read a letter in a magazine recently about the benefits of importing queen bees from Crete and showing a frame of brood where every cell was occupied by brood. In reality it is better to have 20% of the area of a brood comb occupied by honey and pollen (**thrift**) so that the bees can come through a period of dearth, the June gap perhaps, or a dry period when the plants come under stress and consequently bees come under stress too.

The letter also talks about 'biodiversity'. Well, biodiversity in bees means to me that they are sufficiently outbred to be vigorous and disease resistant, and sufficiently inbred to remain true to type, the type being the bees that belong to the locality. As mentioned previously, a large proportion of our bees in this country have been imported at some time or other, so they have their own mechanisms for self improvement, as well as overcoming the effects of bad winters.

A queen from Crete mated to a local drone would just extend the weaknesses of the imported queen into the local bees as previously discussed, which leads in turn to **susceptibility**, which takes a long time for a beekeeper to sort out. It is immaterial how much honey they might make under ideal conditions if they won't stand foursquare on their own feet.

I admit to knowing little about genetics. If you take the Khaki Campbell duck or the Black Rock hen these breeds are far better than the sum of their parts but the parents are always the same breeds and offspring are always true to type. This might happen with bees as well but it is much more difficult to achieve.

I remember years ago when there were cottage hives for section production. Bees don't like sections especially in the spring and with a zinc excluder. The bees often filled five frames with brood and left with a top swarm which, if there was somebody at home, could be dealt with by killing the queen as she ran back in and reducing to one queen cell at the required date.

This situation was often made worse by the beekeeper using all the sugar in the house and feeding the bees not at all, which meant that the hives which filled the bottom survived, and the ones that put honey up in the supers died out. This resulted in a very poor quality bee, quite useless in fact.

However there were beekeepers who selected the best hives every year and reared a few queens and united them back to the poorer ones and so began a system of selective breeding. The late Willie Smith of Innerleithen is an obvious example of a progressive beekeeper. He was Scotland’s first commercial beekeeper and the inventor of the Smith Hive. George Hood has his bees now, and it shows. The late Alec Cossar of Kelso gave them extensive bottom ventilation, an empty deep in fact and he always had a few queens ready for the heather. He was a gamekeeper, so he had the time to do it, which was critical.

The late Rob Brown of Pallinsburn had big WBC hives, all in a row, outside the gardens where he was in charge. His bees would work sections from May onwards. He eliminated the swarming tendency by removing queens that persistently built cells and breeding off the ones that didn't. He also eliminated queens that bred bees that didn't seal the sections to show standard, believe it or not!

My point is that these beekeepers could produce some quite excellent colonies of bees from the ones they already had. When nuclei are united to strong colonies they become habitually and genetically stronger, just as the little section hives were habitual swarmers, same week every year and so on.

The queens that progressive beekeepers raised would often be mated with a close relation or sometimes to a feral drone or one out a cottage hive and that prevented things going wrong as a result of inbreeding. Inbreeding would be a precursor to any disease. This is well known throughout agriculture.

After WW2 there were large numbers of black bees imported into Scotland from France, by Steele and Brodie of Wormit, Fife. This race of bee still exists, I believe. Steele and Brodie had obviously done their homework, as these were good bees. Their progeny will exist throughout Scotland today. Steele and Brodie had a vested interest in providing good bees to local beekeepers, as they supplied them with all their beekeeping requirements. Break that trust and the whole lot goes west.

This is in marked contrast to the trade in nuclei of indeterminate provenance, where the seller has no interest in the subsequent fortunes of the beekeeper. This makes life very difficult for beginners. This went on when I was a boy and it still does today.

In Denmark the beekeepers are bounded by a similar understanding. The queen breeders are careful to evaluate the queens they supply, as their future depends on it. The Danes have evolved a system of beekeeping quite different from ours. They need to use polystyrene hives to get their bees through the winter satisfactorily, and they need to change the brood combs annually to guard against brood disease and garner some extra heather honey.

Where the Danish system falls down is the amount of sugar syrup needed to sustain the bees in a bad season. It is demoralising for beekeepers to have to feed syrup in the summer and also costly, and no amount of sugar syrup ever replaced a honey flow. The Danes do their best to minimise risk and in a good season they produce a lot more honey than we do.

In Northern Germany queen breeders have developed the Carniolan bee in a similar fashion, breeding out the tendency to swarm and selecting for resistance to Nozema, as do the Danes. One might hope that these highly skilled people will eventually breed bees that are resistant to Varroa.

At present the Danes try to eliminate every last Varroa mite from their hives. We must do the same or lose our business and our livelihood.

This situation is in marked contrast to the general thrust of this article in that as beekeepers we must try to keep bees that have achieved total, natural resistance.

I have heard of beekeepers who are keeping bees without treatment and there are colonies that are able to withstand high numbers of Varroa mites.

But we, and most other beekeepers, exert commercial pressures on our bees (transport), as well as treating them and that tips the balance against them acquiring natural resistance to Varroa.

It is ever increasing commercial pressure which is causing so much trouble with honeybees worldwide. I met a honey farmer from Austria (1,500 hives) who didn't treat his bees and who lost two thirds of his colonies every winter. His greatest problem was the continued presence of swarms and drones that had come from colonies that had been treated, thus negating his efforts and sacrifice.

I would subscribe to the view that if there are Varroa mites in the hives at the heather or during January, getting them through the winter will be extremely difficult.

I believe it was a retrograde step in the 1970s for The Ministry of Agriculture to dispense with the services of the county beekeeping instructors. Beekeeping instructors gained their knowledge from studying the relative success or failure of those they taught, from novices to professionals. Once knowledge is lost the threads are rarely if ever retrieved. Thus we now have a situation of uncertainty when people are trying to pick up skills, worsened when things go wrong.

It may be difficult to avert trouble during the present problems affecting beekeeping, but it would be easier if there was a body of men and women with decades of practical experience to instil some confidence in the profession. This is not to decry the efforts of the people at the beekeeping unit in York and Auchincruive, whose contribution I appreciate. It is very important to look back, but they look forward and have useful information for the present and the future.

For 40 years after WWII, Scotland had a beekeeping education facility which would have compared favourably with any in the world. Since then the countryside has been nationalised and the emphasis placed on administration together with suitable legislation. Such is progress!

The only bonus for beekeepers from this situation is that there is now a large acreage of oilseed rape grown, which was a political crop, but is now valued by farmers as a break crop, especially as the price of cereals remains low.

There were years I remember when when the bees had to be fed right into the middle of June before they got any honey, having missed the early flows due to bad weather. This underlines how tough the bees must have been; that they could go through 9 months of relative confinement and still fill a few supers in July. I remember being at the Highland Show and no-one had seen a queen cell by the 20th June. *

'A swarm in May is worth a load of hay,
a swarm in June is worth a silver spoon,
a swarm in July is not worth a fly'

*(Bees build queen cells prior to swarming, which generally begins in the first week in May.)

The oil seed rape has changed that situation. Colonies have become much stronger and softer, particularly in the South of the UK. Beekeepers in the west of the UK will find things more difficult without oilseed rape, especially during bad weather. Oilseed rape honey finds a very good market, especially if it is free from taints and **not over-heated**.

I remember Canadian honey being imported into this country called Honey Boy which was a mixture of oilseed rape and clover honey, prepared using the Dyce process. This product was in huge demand. With the right skills and initiative Great Britain could produce far more honey than it does for the home market.

Creosote was used extensively by beekeepers in days gone by. The hives and the garden shed were coated-up annually. This gave the beekeeper a feeling of well-being and didn't seem to bother the bees, but it did get into the honey. Honey takes on every taint there is: dampness, mould and so on.

From the mid-1950s onwards there was a period of uncontrolled use of pesticides which killed bees in great numbers for about 40 years. The situation was bad in the south of England (because of the number of fruit trees) and vastly worse in the USA. A chemical called Hostathion caused beekeepers years of trouble and loss.

Since then things have quietened down until we are now faced with systemic insecticides. What effect they will have only time will tell. Beekeepers and the public are rightfully suspicious and the chemical companies powerful and the governments weak. The real effects f pesticides are felt about 10 years after they are introduced.

Hopefully we can soon use organic acids reliably in the treatment of varroa and so eliminate another of the great contradictions of the beekeeping world, namely that we have spent years fighting the chemical companies and now we are dependent on them to keep our bees alive.

My father said: “Never put in a beehive what you wouldn't put in your own mouth”. I can remember Benzine being used to treat Acarine perhaps in the 1950s, but not at our premises. But then we all need medicines at sometime in our lives to keep us going, but not prophylactically. I think that is what my father meant.

If queens are being imported from Southern Europe and have been reared in hives treated with antibiotic prophylactically then their progeny will have lost all immunity. This poses huge difficulties for beekeepers in this country. Health certificates would be valueless in such circumstances. *

* Prophylactic: annual or frequent treatment. Ceasing the treatment will generally cause the bees to contract the disease being treated.

Regarding the present situation in Scotland I have heard of these problems over a period of 10 years or so in many parts of England. I would guess that the common factor was and is the presence of varroa mites that have become difficult to treat. Added to that a period of prolonged bad weather and large numbers of hives in one area, as well as great numbers of imports as replacements.

I imagine that similar situations exist in Southern Europe, but with better weather. There would have been far more bees in the East of Scotland 50 years ago, but they would have been more evenly spread, being smallish colonies of thrifty bees and the surrounding countryside would be much more supportive. The bees would be productive and a very useful part of the rural economy.[1]

[1] For the pollination of raspberries. This also provided nutrition.

I can remember that we had trouble with dysentery during the winter of 1962-3, owing to the bees being confined for months. Since then we have never had any concern about disease in our bees. Even in the winter 1985-6 most of them came through in a weakened state. I would guess that 75% of the bees in Scotland died out in that winter as a result of Nosema. Despite a further two appalling seasons the bees in Scotland recovered very quickly to the point that by 1990 it was as if nothing had happened.

Now with the continued presence of varroa I don't have the same confidence about our own bees being able to withstand anything that the weather can come up with.

As for the detail of the Scottish problems, European Foul Brood is about poor nutrition and genetics. (**Susceptible**) This would be most easily rectified by a good summer, but the genetic problem remains. Whoever 'improved' the bees originally has caused them to lose resistance to EFB and probably nosema and other diseases and these genes spread among the local population via the drones. EFB was unknown in the North of England and Scotland all my life, although it would be endemic. I hear reports of American Foul Brood as well and I am not sure that where there is EFB, AFB is not far behind.

I consider that bees can be resistant to AFB as well, given the amount of foreign honey that was thrown into tips. A cereal factory near here left open barrels of foreign honey for years on end yet none of the local bees were ever found to have AFB. This is total natural resistance by luck more than by design. The biggest outbreaks of AFB were around honey packing plants where the owners were keeping bees of their own and feeding foreign honey to them. I have heard of this still being done, believe it or not.

My father would oversee thousands of colonies of bees in the Scottish Borders and came across AFB rarely and only when nuclei had been brought in from further south. These colonies were always treated and a 3 year inspection routine followed without recurrence.

My father's friend and fellow beekeeping advisor, Bob Couston, had much more trouble with AFB in Perthshire, where bees were found to be living with the disease, the colonies being resistant to it most of the time. This proved to be a difficult nut to crack, and although I am talking about 30 years ago I wouldn't be surprised if the present AFB is derived from the same colonies.

Where there is AFB something has to be done about it. I would suggest that burning a colony with EFB is like shooting someone who has a bad cold.

Treating them doesn't address the problem either. Putting them on new combs is a good idea. Doing that would also control Nosema to a degree.

Throwing the brood away seems a bit drastic. If it were me I would make an artificial swarm so that the queen was on new combs and take the brood and young bees away to another site to rear a young queen.

Better still, I would put in a queen cell from a local bee. [1]It could be that a change of queen is all that is needed (**Genetics**). Thereafter, the pressure needs to be taken off. Better sites need to be found for the bees, with fewer colonies at each site. It would be preferable to have 12 hives per site, sub divided into 2 lots. (**Nutrition**).

[1] A movement order might prevent this happening?

This is all easier said than done, but it has been done. Bees will generally get over these problems themselves, given time and consideration.

Good sites are paramount. I remember the late Tom Bradford complaining about EFB in Worcestershire in the late 1960s. Years later I spoke to the foul brood officer for that area and he told me about big colonies of bees in the orchards with three supers of honey on them and a bad infection of EFB. The bees have committed themselves to extensive broodrearing on the back of a good flow and then there isn't enough protein to build all those bodies. The ground gets dry or then the weather changes and there you go: expanding colonies with prolific queens but inadequate nutrition.

Tom said that if the bees were strong enough to fill a box of honey in May, they were strong enough to eat it in June. The same goes for pollen.(**Starvation)** The problem may be the lack of specific pollens.

Our own colonies often take a break from brood rearing during the summer. This may be a safety valve, who knows.

In conclusion I have tried to pinpoint some of the problems that are making beekeeping difficult at present. The article has been written to make beekeepers understand and think about whet they are doing and read between the lines. Honeybees are hugely sophisticated and it therefore follows that they will need a great deal of respect and consideration. Roughshod solutions and quick fixes generally spell trouble unless the colonies are exceptionally robust.

When I read in magazines about people making splits I wonder. It is all very well dividing colonies piecemeal when they are bursting with bees and the weather good. Trying it in a bad season as a method of swarm control or preparing for the heather generally spells trouble. (**morale, Nosema)** If they don't want to swarm then it is for a good reason. I don't like these tiny mating boxes either. Bees hate to be in small lots **(Nosema)**. They feel vulnerable, which is presumably why the queens mate quickly.

A scientist came from America about 25 years ago to look at our bees with a view to importing them into the States, as they were resistant to Acarine. He was not impressed with what he saw: smallish lots cowering down in a north easterly gale. But they were all alive and went on to get some honey and make a profit. (Bob Couston sent some queens over at that time). Their bees, by contrast, were suffering huge losses due to Acarine.

If we lose our bees then we have to buy more bees in. Therein lies the risk. Better by far to try and keep the ones that we already have and buy in as a last resort.

I feel that the Americans have bred immunity out of their stocks many years ago. This ties in with general agricultural practice. Honeybee colonies by contrast strive to be immortal. They will not achieve that without immunity. Their immunity is further eroded by harsh management for economic reasons and then there is the Varroa mite and the winter and there you go.

Research is important, but not totally necessary. Those doing research need to have a very thorough understanding of bees and beekeeping or it will be difficult to come to any sensible conclusions.

A honeybee colony will be sentient. The bees are aware of how they have been treated and how they feel and therein lies the key. There are always problems with livestock, but it would be better if we all tried to work with the bees instead of against them and save ourselves a lot of trouble. Beekeeping can often be deceptively easy and at other times very difficult, as at present. Honeybee husbandry is about degree: too many mistakes or even one mistake and big problems arise. Fortunately bees recover quickly. Beekeepers worldwide must learn to tread a fine line, or try something else.