way had some panel damage and the farmer got some training in middle distance running. Investigations the next day revealed a few wasps buzzing around what was left of the nest. These are the things that happen.

Problems with Queens - the Weather, Disease or Insecticides?

Unfortunately for many years now Great Britain has suffered from low pressure systems coming in from the Atlantic every 36 hours or so during high summer and this has not helped beekeeping. Queens haven't the confidence to get mated because of constant downpours and the bees are finding fault with their queens and constantly trying to replace them. If a honeybee colony suspects that there is a problem within the hive with for instance, susceptibility to disease, the bees change the queen, in the hope that a change of genes will eliminate the trouble. This is exceptionally sophisticated behaviour. Similarly one might assume that if the queen is affected by minute traces of insecticide within the hive and the bees are concerned about her ability to perform satisfactorily they will reject and replace her.

I think that these swarms that go about in high summer and never become established are swarms of hopelessness and I cannot say what will be the cause – weather, varroa or insecticide. Probably we will never know. But if bees are collecting nectar and pollen from the flowers of plants which harbour systemic insecticides it is highly likely that the queen will be affected and the bees will reject her.

A Ukrainian hive
which allows the bees to build a nest as they would in a hollow tree

- Its three-storey construction has modified, metallic top bars for the frames, and each box of frames is set at right angles to the other.

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The basic idea of this beehive is the placing of the frames cross-wise to each other in a two or three storey colony. This new design creates a more natural structure for the colony allowing the bees to replicate the type of bee nest they would build in a hollow tree, where the honeycombs are built not only downwards but also across from each other. Most of all the modified frames with a metal top bar are important features of the hive which give several advantages over conventional frames. A partly similar design of beehive was used by I I Korablev (1929). It was found that this improved design provides easy maintenance and less time in the manipulation of colonies. It was also noticed that colonies kept in this type of hive showed an improvement in their health aided in particular by the water which condensed on the layers of propolis within the nest.

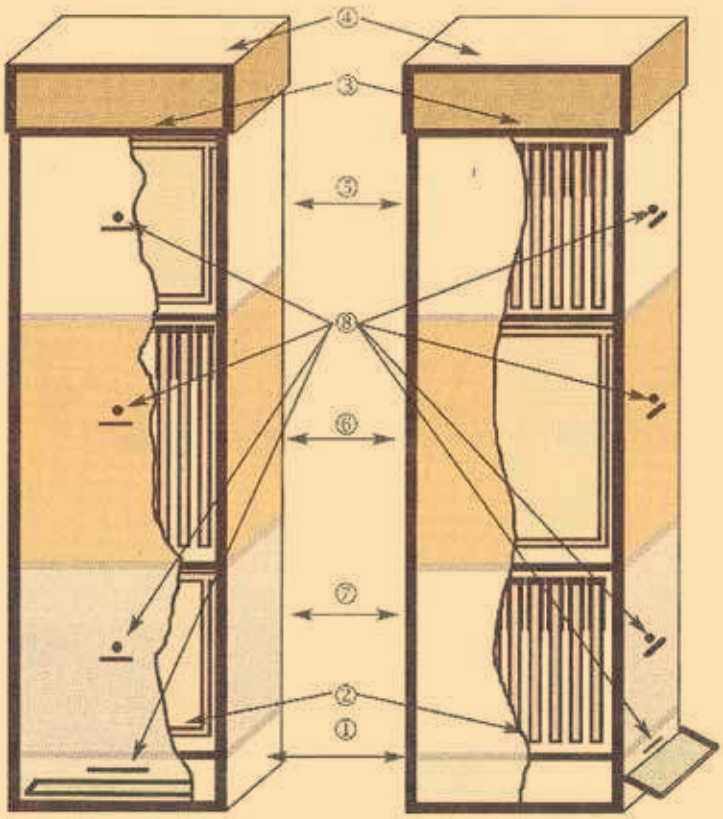

Diagram of the main parts to the hive.

The main features of the 3-storey hive are:

(1) A space in a specially designed bottom body with a height of 10 cm, which improves ventilation;

(2) The frames in the lower and the third storey have a frame size of 460 mm x 240 mm;

(3) The frames in the middle storey are tall and narrow: 260 mm x 410 mm; these frames are used for the production of brood;

(4) In the lower and top storey 8 frames are used, in the middle storey there are 12 frames;

(5) The orientation of frames in the beehive are: in the lower box the 'warm way'; in the middle box the 'cold way'; and in the upper box the 'warm way';

(6) The frames all have a modified design with a "n"-shaped upper metal bar to secure the honeycomb;

(7) The frames in each of the boxes are separated by the normal bee space but the upper and lower bars of the frames in each box fit tightly on top or below each other but cross-wise on - any space less than 3.1 mm being filled with wax;

(8) The frames which are at right angles to each other are easily separated and removed from the hive as wax is only connected at intersections.

By using this new design we have found the following advantages:

(1) The cross-wise placing of frames in the 3 - storey beehive with the additional 10 cm space beneath the bottom of the combs in the the lower box provides good ventilation.

(2) The presence of a 10 cm space under the combs in the lower hive body and its opening side wall gives the ability to control the state of the honeybee colony. When drone cell "tongues" are appearing in the lower body, these drone brood combs could be cut and removed easily.

(3) The metal top bar of the frame provides strength and durability, as well as increased condensation inside the nest on the parts smeared with wax and propolis. The use by bees of condensed moisture from the surface of propolis creates conditions inside the nest which are disinfected and free from microorganisms.

(4) Good wintering of the honeybee colony can be ensured by using just the one box for the brood with the narrow and tall frames (210 mm x 460 mm). The presence of only one box of stores, or two for a stronger colony, allows successful overwintering (100% survival in a last 7 years) and the rational use of honey by bees during the winter.

(5) Usually queen replacement occurs every three years through supersedure.

(6) Our observations have showed that during swarming time a large colony is only partially divided, usually with a small first swarm with a weight of only 0,5 - 1,0 kg, and that after-swarms are rare.

(7) A Hahnemann's plate (queen excluder) is not used between the middle and upper hive storey, the latter being used for honey storage.

(8) In the upper storey (or honey super), the honeybees normally produce thick, sealed combs of honey covering between 90% to 95% of the frame (see photo).

(9) There are very few manipulations and observations of the colony during the season; one at the beginning of May, for the expansion of the brood nest; one at the beginning of June to mid-June for the harvesting of honey; one at the beginning of August for the second honey harvest; and one at the beginning of September, preparing for the winter.

(10) In early to mid-June the first honey harvest is taken up from the upper hive body (6 frames of honey or about 18 kg). During the season the bees collect between 40 - 50 liters of honey in a 3-storey hive, even without moving colonies to another site. So, we consider that the new design of hive has helped to increase our honey production compared with the conventional hives we used before.

(11) The honeybee colonies live under healthier conditions in the new beehive (based on seven years of experience).

(12) Raising and managing colonies is simplicity itself using the new design.

(13) There is a significant reduction in management time for each colony during the season.

Above left. The author Priyatelenko V.Ya with three of his hives.

Above right. The hive is made up of three storeys, the large central chamber, a shallower lower chamber and a top shallow chamber for honey storage. The lower chamber has an extension without frames. There are three hive entrances, one in each box, as well as the main one at the bottom of the hive. These can be opened or closed throughout the seasons to provide the bees with the best natural nest environment.

The unique metal top bar has a 'n' cross-section which initially holds the foundation in place.

Above and below: The brackets on the top bars allow the wooden frames to be fixed to them. There are eight frames in the lower and upper chambers. Notice that the boxes are rebated all round at the top allowing them to fit together and to give extra stability during transportation (very much like the old Wormit Commercial Hive).

Above and below: On the topmost chamber, the honey super, plastic sheeting is placed directly on top of the frames. NB the large spaces between the top of the frames in which the bees build plenty of wax, but leave space for ventilation and access, are an important feature of the hive.

Left. On top of the plastic sheet battens of wood are placed to make an internal wooden cover.

Above. The central chamber, the topmost brood chamber, is placed at right angles to the upper and lower boxes. The frames are deep and narrow. The outer frames have been filled with honey.

Below. The lower chamber has a 10 cm deep extension with a removable door. This space (without frames) helps with ventilation and allows the bees to build free comb below the brood nest. Drone comb when built here can be removed if unwanted; the building of the comb also indicates the status of the colony and that swarming time is nigh (similar to the drawing frames in the German and Swiss hives in bee houses).

Comb built beneath the lower chamber.

Main picture: With the frames in the boxes above and below being cross-wise to each other, inevitably wild comb is built - but the bees leave conduits for access to other parts of the hive as well as for ventilation. Importantly, the bees construct wax bridges throughout the hive, thus joining frames together, allowing the bees to communicate effectively with the vibrations from their dances.

Inset: A strong colony. The bees usually replace their queens by supersedure every three years. Should swarms occur, the prime swarm is not huge and it is unlikely that casts will be thrown.