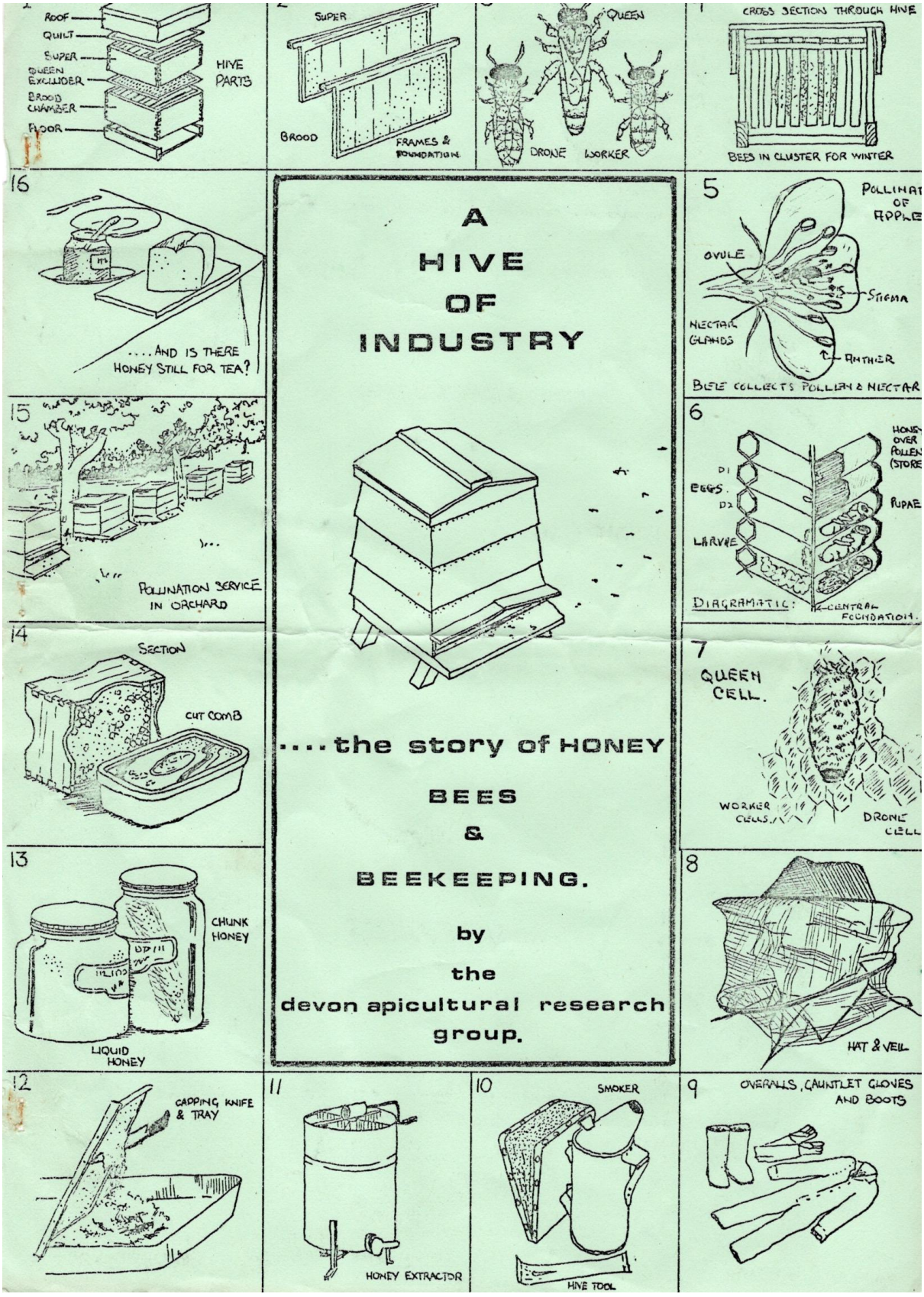
An early example of Devon Apicultural Research Group's information leaflet that was handed out to prospective beekeeping beginners.
Written in the early 1980's this was a joint publication with Devon Beekeepers Association.



" A HIVE OF INDUSTRY "

by

the Devon Apicultural Research Group

1. THE HIVE AND ITS FURNISHINGS

The domestic hive is generally made of RED CEDAR imported from Canada. It has an independent FLOOR set under a deep BROOD CHAMBER in which the queen lays eggs and the young bees emerge. Above this is a QUEEN EXCLUDER, a metal sheet with narrow slits or fine mesh to stop the queen moving up and laying eggs in the HONEY SUPER above. From this super will come the honey destined for your table. On top of the super rests a CROWN BOARD or light cover and overall a ROOF to keep the hive warm and dry. As more honey is produced extra honey supers may be added by the beekeeper.

Inside both the brood box and the honey super hang wooden FRAMES (10-11 in each) into which the beekeeper fits thin embossed pure beeswax FOUNDATION. The bees make wax and build out hexagonal CELLS on either side of this foundation. The queen will lay her EGGS and the bees will deposit honey and pollen in the cells in the brood chamber and normally only honey will be stored in the super above.

2. THE OCCUPANTS OF THE HIVE

The QUEEN: she is the only fertile female in the hive and normally there is only ONE per hive. A queen emerges from a large cell like a small peanut husk wherein she has fed on ROYAL JELLY. Her court of attendant bees feed and groom her constantly - she cannot feed herself. At the height of the season she will lay up to 2000 eggs per day, one to each cell.

The DRONES: these are the fertile male bees, whose function is to fertilise any virgin queens that may be produced by their own or other colonies. They are produced in spring and in the autumn they are starved and ejected from the hive. Only a few hundred are produced in the colony. A drone, larger than a worker bee, emerges from a hexagonal cell, similar to but larger than a worker cell.

The WORKERS: these are infertile females and in summer the colony may contain forty to sixty thousand of these industrious creatures. As it matures a worker is engaged in a wide range of duties; it cleans and polishes cells, feeds drones and young bees, tends and feeds the queen, produces wax and builds comb, keeps the hive meticulously clean and ventilated, guards the hive and eventually becomes a forager for water and food, the latter requiring most careful storage if not to be used immediately. In the winter they form a CLUSTER, a close rugby-football shaped mass of bees inside the hive, to keep themselves and the queen warm. The cluster expands and contracts according to the climate to maintain a stable temperature and humidity at the centre where the queen is. The average lifespan of a worker bee is 9-29 weeks according to season and activity.

NAVIGATION: foraging bees have a very acute sense of the location of their own hive and by means of a BEE DANCE can indicate to others in the hive the exact direction and distance of the source of pollen and nectar that they have just visited.

TEAMWORK AND TIMING: the craft skill of the beekeeper, the instincts and energies of the bees and their joint opportunism with the climate must combine for successful honey production. A good queen, ample stores and brood space are basic essentials. In spring the colony must achieve a dynamic build-up to maximum mature strength in readiness for the flow of nectar when it comes. At harvest time the colony needs to concentrate its energies on foraging and storage rather than on brood rearing. At other times, to conserve stores, the beekeeper and to a degree the bees themselves will discourage excessive egg-laying by the queen.

3. RAW MATERIALS - THEIR SOURCE AND USE IN THE HIVE

PROPOLIS: this is a gummy substance, often red or orange in colour, usually collected from the bark or leaves of trees and used by the bees to seal cracks and to secure some areas inside the hive.

POLLEN: like a coloured powder, minute grains collect on the hairs of the bee as it enters each flower in search of nectar and/or pollen. With combs on its legs it collects these grains into a compact mass on each back leg. The pollen varies considerably in colour according to the flower visited. The bee then returns with this load to the hive.

If left exposed, pollen will deteriorate. Pollen not required for immediate use is lodged at the bottom of stores cells in the brood chamber where the bees cover it with honey and eventually seal it over with a wax cap. In this state pollen will remain in perfect condition for very long periods. Bees do not normally store pollen in the honey supers above the brood chamber.

NECTAR: when the flowers are open and the climate right, certain flowers (e.g. clover, bramble etc) secrete nectar which the bees collect with their long tongues. Nectar is like a sweet syrup, the flavour and degree of sweetness varying in different flowers.

WATER: this is vital in the hive and is collected by worker bees. (see Bee Bread)

BEE BREAD: the worker bees mix Pollen, Nectar and Water to feed to the young bees. We call this bee bread.

WHAT IS HONEY? The bees subject nectar to two major processes. First, with enzymes (e.g. invertase) active in their mouth parts and honey sacs, they 'invert' or 'activate the change' of sucrose into dextrose and laevulose (glucose and fructose respectively.) Secondly, they reduce the water content of the nectar from around 80% to as low as 17%. These now highly concentrated substances, together with the original traces of minerals and protein, constitute Honey. Only now will the bees seal each cell with a wax cap. These processes require a vast expenditure of time and effort and are vital for the over-wintering and survival of the colony.

WAX MAKING: the flying foraging worker bees have to provide food for the queen, the young, the nurse bees, the drones and all inside workers. Honey is also required for wax-making to build and cap cells. Wax is secreted in the form of tiny platelets from glands in the abdomen of worker bees so engaged. It takes several pounds of honey and much time and labour to produce a pound of wax, hence the extra cost of cut comb and section honey.

WINTER STORES: each hive needs 30-40 lbs of honey for its own winter stores, to use in the spring to feed the colony, including the young bees, before the flowers come into bloom. In order to produce the field force for the coming season the queen may begin to lay as early as February and the bees use up stored honey as they generate the heat necessary in the brood chamber. If in autumn the beekeeper takes too much of their honey, or fails to make up any stores deficiency with sugar syrup, the colony will die; he may take only the surplus! Seasons vary, he may have much, little - or sometimes no honey for himself - the bees' requirements must come first.

4. THE BEEKEEPER AND HIS EQUIPMENT

Bees need to protect their colony and the stores upon which they depend for survival - their stings are their defence. The beekeeper needs protection: a beeproof OVERALL, wellington BOOTS, gauntlet GLOVES and a HAT WITH VEIL over his head, face and neck.

For tools he has a steel lever or HIVE TOOL to open the hive and ease frames. He also requires a SMOKER, smoke being helpful in distracting the bees and making them easier to manage when the hive has to be opened up.

5. EXTRACTING HONEY

The only honey the beekeeper takes is that which is mature honey, from cells covered with wax CAPPINGS. The cappings are removed with a warm CAPPING KNIFE and frames thus uncapped are placed in a CENTRIFUGAL HONEY EXTRACTOR which spins the honey out of the cells.

This honey is then strained and left in a HONEY TANK for all the air bubbles to rise out; it will be ready for bottling in a few days. Any wax, e.g. the cappings, is melted, filtered and used for polish, cosmetics and new foundation for next year.

6. HONEY FOR YOUR TABLE

This pure honey, light, medium or dark according to the origin of the nectar, is now BOTTLED and LABELLED. Some beekeepers cut pieces of full comb out of the frame and market CUT COMB in plastic boxes; others may have their bees produce honey in 4" square sections, although it is not easy to make bees work within these small wooden frames. In some cases CHUNK HONEY is prepared, a chunk of full comb in a jar of liquid honey. In time, English honey crystallises, but can be returned to the liquid state by warming in a saucepan of water (just bearable to the hand.)

7. POLLINATION

In orchards and fields alike, the pollination which bees achieve in the process of collecting pollen and nectar is a most valuable service; in some areas farmers pay for hives to be stationed on their land during blossom time for this purpose - resultant crops are more plentiful and of a better quality.

" A YEAR IN THE APIARY "

Let us begin in the autumn, after the beekeeper has taken his harvest.

SEPT - OCTOBER

Check that the hive has a queen and adequate winter stores; feed sugar syrup if necessary. Reduce entrance against robber bees, wasps and mice. Secure the hives against winter storms.

NOV - MARCH

Bees semi-dormant and in CLUSTER. On fine days some will take short cleansing flights. In March, if bees are seen bringing pollen into the hive one may assume that the queen is alive and laying and that brood is present - a welcome sign.

MARCH - MAY

The queen is now laying eggs which will become the new season's force of foraging bees - this is where the bulk of the winter stores goes - on feeding these young bees.

JUNE - JULY

Swarm time. Some hives may have bees swarm out to form new colonies - a survival device. Up to half of the colony may leave the hive with the old queen, while the remaining bees raise a new queen.

JUNE - JULY (- SEPT if bees are taken to the Heather)

The flowers are producing nectar and all the bees are very active - this is harvest time for the bees.

AUG - SEPTEMBER

Drones are no longer required for reproduction and are ejected from the hives by the workers, thus saving winter stores. As soon as the nectar flow stops, the beekeeper will remove the honey supers containing the surplus honey - this is harvest time for the beekeeper.