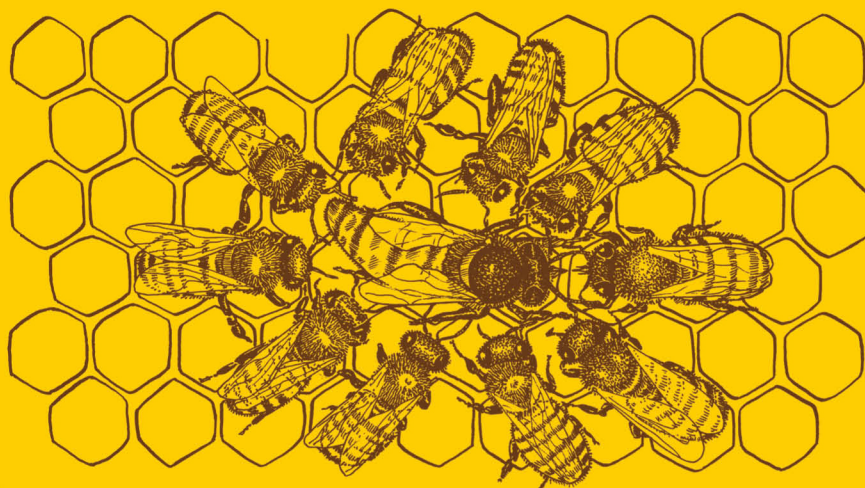


THE GRAPHIC GUIDE TO BEEKEEPING



Your Complete Visual Resource for Sweet Success



Yves Gustin

1,000s OF DETAILED ILLUSTRATIONS PUT THE ESSENTIALS AT YOUR FINGERTIPS!

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THE LIFE OF A BEE



TO TELL YOU ABOUT THE LIFE OF A BEE, NO ONE'S BETTER PLACED THAN A BEE ITSELF, SO I'LL LET HIM EXPLAIN.

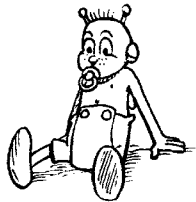


HELLO!



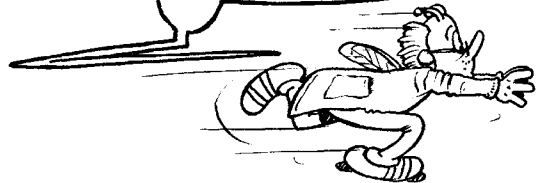
MY LATIN NAME IS *APIS MELLIFERA*. I BELONG TO THE *APIDAE* FAMILY, AND I'M PART OF THE *HYMENOPTERA* ORDER. I COULDN'T SURVIVE ON MY OWN; I HAVE TO LIVE IN A COMMUNITY (WILD OR DOMESTIC). MY COLONY CONSISTS OF ABOUT 50,000 SUBJECTS. BECAUSE OUR FAMILY'S SPREAD OVER VARIOUS PARTS OF THE GLOBE, BEES LIVE IN CLIMATIC VARIATIONS. THAT MEANS WE'VE ADAPTED, RESULTING IN CHANGES THAT ALLOW US TO BE CLASSIFIED INTO DIFFERENT SPECIES. HONEYBEES IN THE U.S. ARE DESCENDED FROM BEES BROUGHT FROM ITALY, EASTERN EUROPE, RUSSIA, AND OTHER PLACES.

YOUNG BEE



MORE AND MORE, BEEKEEPERS ARE CALLING ON MY FOREIGN FRIENDS. FOR MORE AUTHENTICITY, I'LL LET THEM PRESENT THEMSELVES.

STOP WITH THE GERMAN! I'M GOING TO INTERPRET FOR YOU. IT'LL MAKE IT EASIER FOR OUR READERS.



GUTEN TAG!
MEIN NAME IST *APIS MELLIFERA CARNICA*.

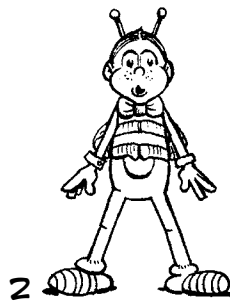


The introduction of new races can be beneficial to your hives. However, after a while, crossbreeding will bring about a change in bee behavior.



1

1. The *Apis mellifera carnica*, or Carniolan honeybee, is widespread in eastern Europe; it's silver gray in color, with a calm character. It has a long proboscis and a tendency to swarm.



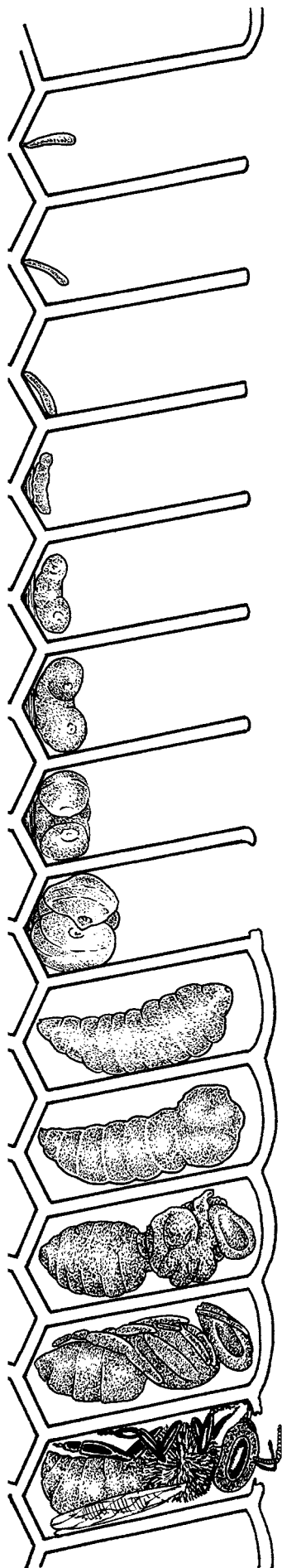
2

2. *Apis mellifera ligustica*, or Italian bee. Golden yellow in color, easy to handle, it remains calm during your work in the hive; it's a good worker.



3

3. *Apis mellifera caucasica*, or Caucasian bee, originating from Russia. Very gentle and a very good forager, it produces an enormous amount of propolis.



DAY 1: The translucent white egg, measuring 1.5 mm, is at the bottom of the cell, attached at its smallest end.

DAY 2: The egg begins to tilt.

DAY 3: The egg is lying at the bottom of the cell. During the first three days, the embryo develops inside the egg.

DAY 4: The larva comes out of the egg, and a nurse bee deposits a drop of royal jelly in which the larva will bathe and feed.

DAY 5: Constantly fed, the larva grows rapidly and begins to take on a curved shape.

DAY 6: The larva fills the bottom of the cell, and its two ends meet.

DAY 7: Nurses stop feeding the larva royal jelly, which is replaced by a porridge made of honey, pollen, and water.

DAY 8: The larva's diet consists of the same ingredients as before; however, the amount of pollen it's given increases more and more until capping.

DAY 9: The wax makers seal the cell containing the larva with a material made of wax, pollen, and debris; this cover allows air to pass through. The larva changes its position so that its head is directed toward the exit; from that moment on, it wraps itself in its silk cocoon, secreted by salivary glands.

DAY 10

DAY 11: Transformation of the larva into a pupa

DAY 12

DAY 13

DAY 14: Rest period

DAY 15: The pupa is complete.

DAY 16

DAY 17

DAY 18

DAY 19

DAY 20: Metamorphosis of the pupa into an insect

AS SPRING APPROACHES, THE QUEEN SETS TO WORK, AND IN EACH CELL YOU FIND AN EGG. LET'S TAKE A FERTILIZED EGG AS AN EXAMPLE AND SEE HOW IT EVOLVES.



THE METAMORPHOSIS



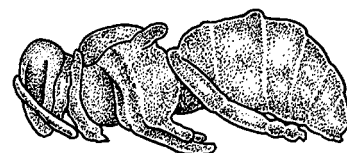
EGG



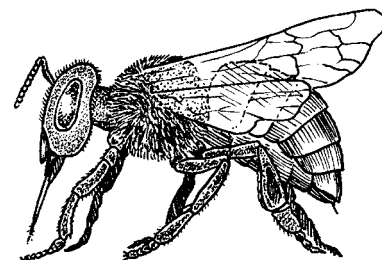
LARVA



LARVAL STAGE



PUPA



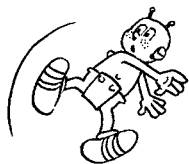
BEE



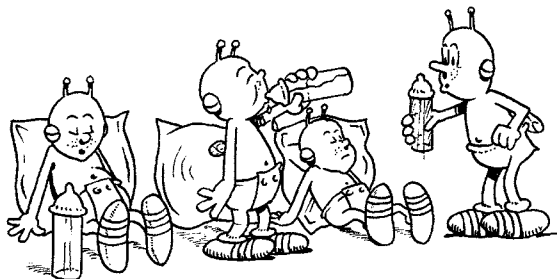
DAY 21: THE BEE EMERGES FROM THE CELL BY TEARING THE CAP, AND ONCE OUT IT HURRIES OFF TO WORK.



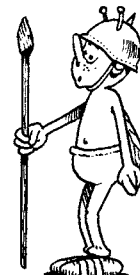
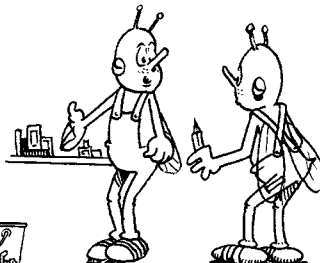
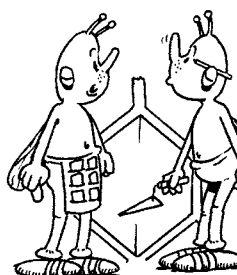
DAY 1 AND DAY 2 OF ITS LIFE, IT CLEANS THE BROOD CELLS.



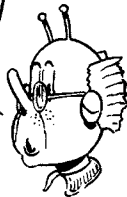
FROM DAY 3 TO DAY 10, IT BECOMES A NURSE THANKS TO ITS HYPOPHARYNGEAL GLANDS THAT DEVELOP DURING THIS PERIOD.



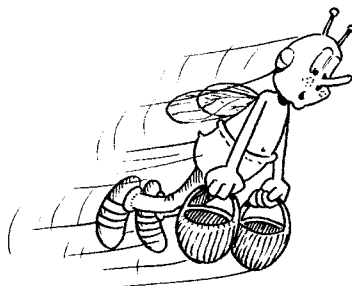
FROM DAY 11 TO DAY 20, THE HYPOPHARYNGEAL GLANDS ATROPHY AS WAX-PRODUCING GLANDS GROW. IT BECOMES A WAX MAKER AND A BUILDER IN CHARGE OF THE INTERIOR WORK OF THE HIVE; IT'S ALSO A STOREKEEPER, FANNER, DRAFT-PROOFER, AND GUARD.



FROM DAY 21 UNTIL ITS DEATH, IT'S A FORAGER. ITS FIRST OUTINGS ARE RECONNAISSANCE FLIGHTS; ITS SUBSEQUENT FLIGHTS WILL ALLOW IT TO BRING NECTAR AND POLLEN BACK TO THE HIVE.

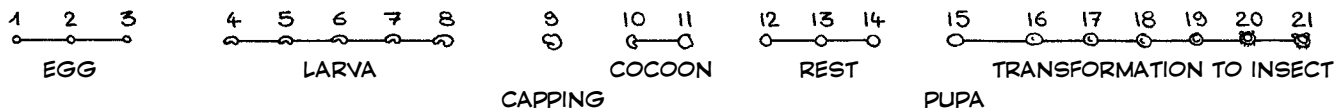


THIS HARD WORK EXHAUSTS THE BEE. IN SUMMER, ITS LIFE SPAN WILL NOT EXCEED SIX WEEKS. IN WINTER, WITH LESS EFFORT, IT WILL LIVE FOR SEVERAL MONTHS.

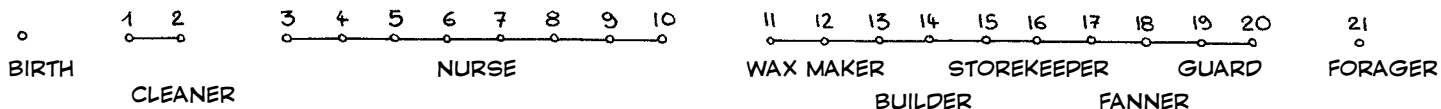


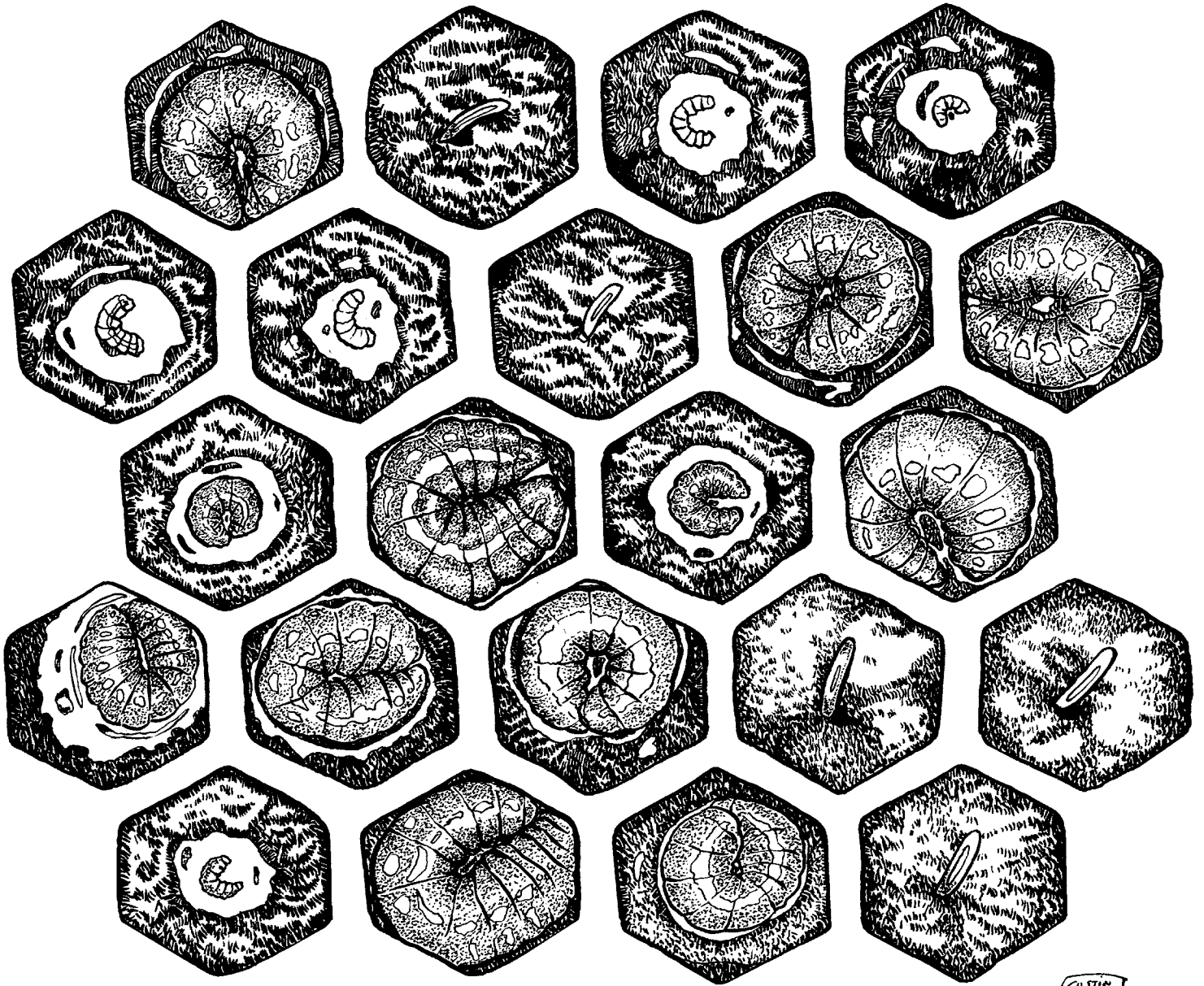
GUSTAV REISER

TRANSFORMATION FROM EGG TO WORKER BEE



LIFE STAGES OF A BEE





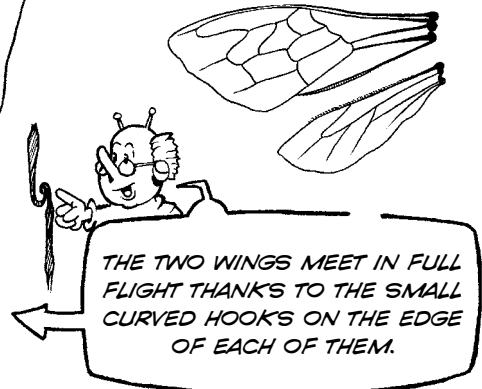
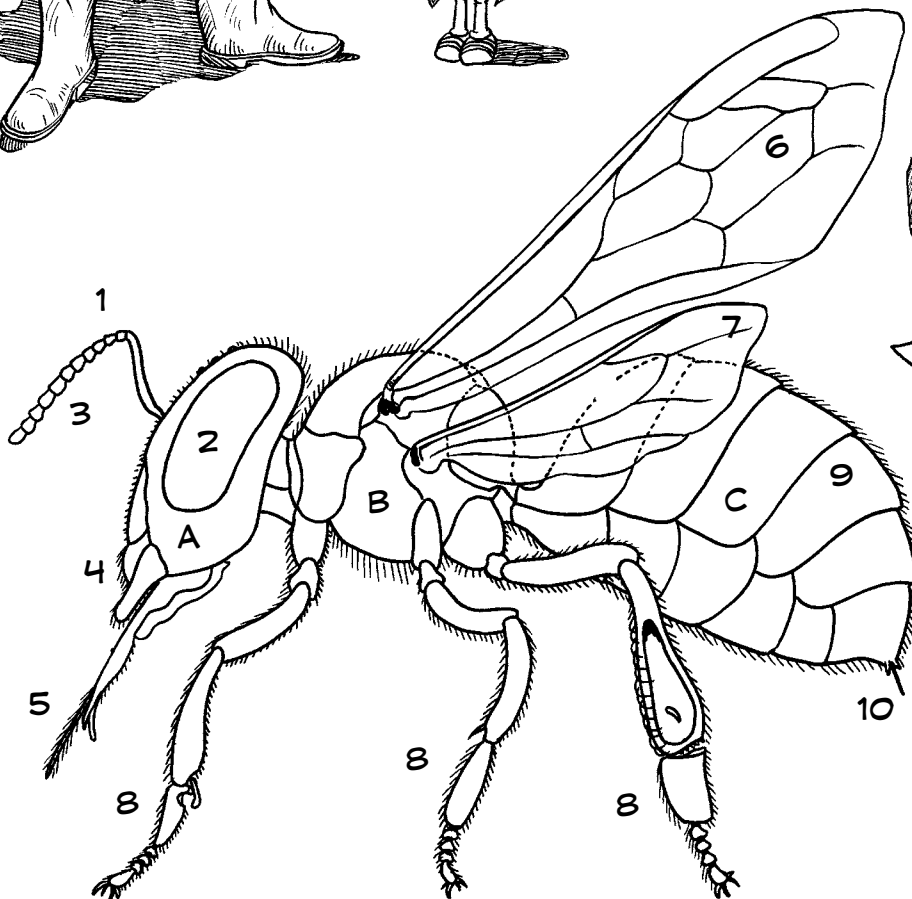
GUTHRIE
420

ANATOMY OF A BEE

WOULD YOU LIKE A LESSON ON BEE ANATOMY? YES? GOOD!
I HAVE AN EXTRA-QUALIFIED TEACHER RIGHT HERE. I'LL LEAVE
YOU IN HIS EXPERT COMPANY TO LEARN ALL ABOUT IT.

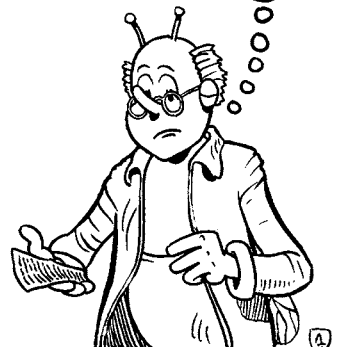
HELLO, DEAR READER!
SETTLE IN; WE'LL START THE
CLASS.

TAKE A GOOD LOOK AT THIS
DRAWING. IT REPRESENTS THE
ANATOMY OF THE BEE. THE BEE IS
DIVIDED INTO THREE PARTS: THE
HEAD (A), THE THORAX (B), AND
THE ABDOMEN (C). EACH HAS
DIFFERENT ESSENTIAL ORGANS.



THE TWO WINGS MEET IN FULL
FLIGHT THANKS TO THE SMALL
CURVED HOOKS ON THE EDGE
OF EACH OF THEM.

WELL, LET'S SEE ...
WHERE AM I NOW?
AH, YES! ON THE NEXT
PAGE, "DEVELOPMENT
OF THE MAIN
ORGANS"



A: Head
B: Thorax
C: Abdomen

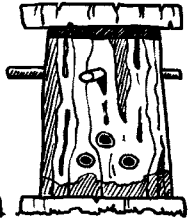
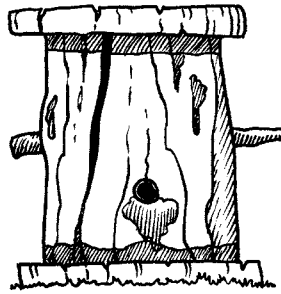
1. Simple eyes
2. Compound eye
3. Antenna
4. Maxillae
5. Tongue
6. Forewing

7. Hind wing
8. Legs
9. Segment
10. Stinger

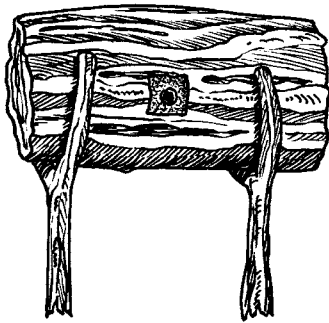
THE HIVE

BEFORE I TALK TO YOU ABOUT TODAY'S HIVES, THEIR FEATURES AND CONSTRUCTION, I'LL START WITH THE HIVES OF LONG AGO.

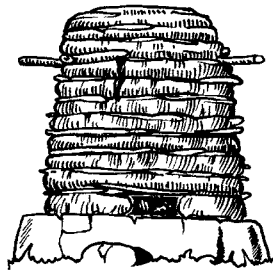
IN THE PAST, BEES USED TO LIVE IN HOLLOW TREES (AS WILD SWARMS DO NOWADAYS). HUMANS TOOK AN EXAMPLE FROM THEM AND SET UP THEIR OWN BEE COLONIES IN TREE TRUNKS. LATER, THE BEEKEEPER USED CLAY AND BRANCHES TO BUILD HIVES, THEN STRAW BECAME THE USUAL MATERIAL, AND FINALLY BOARDS (NOWADAYS, PLASTIC AND ALUMINUM WOULD TEND TO REPLACE THE PREVIOUS MATERIALS). SEE THE DIFFERENT MODELS OF TRADITIONAL HIVES, BELOW. MANY OTHERS WERE DESIGNED, BUT IN GENERAL THEIR DESIGN IS VERY SIMILAR TO THESE.



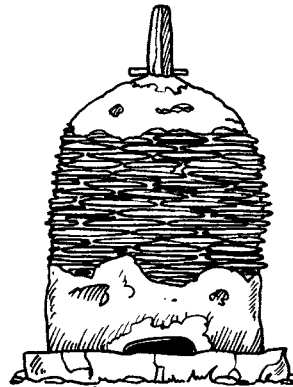
PRIMITIVE "LOG GUM" HIVES MADE FROM HOLLOW TREE TRUNKS



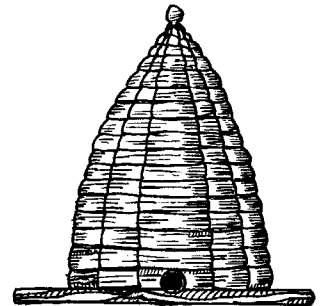
HORIZONTAL IN CORK



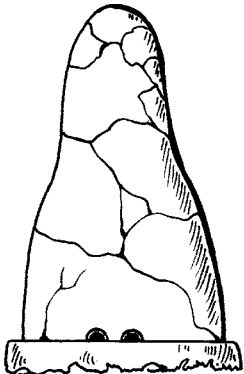
CLAY & BRANCHES SKEP



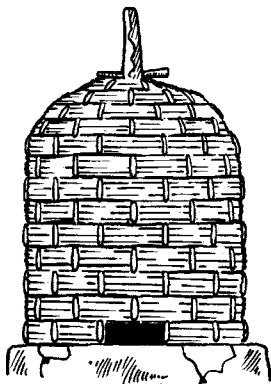
CLAY & BRANCHES SKEP



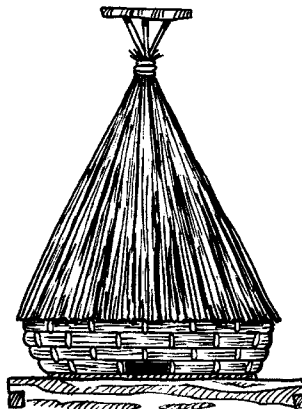
WICKER SKEP



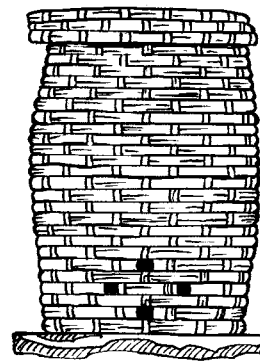
POTTERY



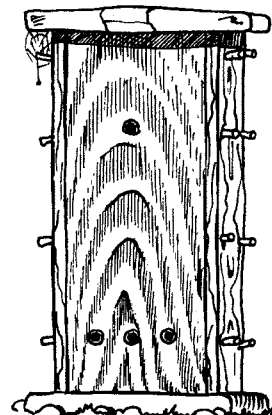
STRAW SKEP



STRAW



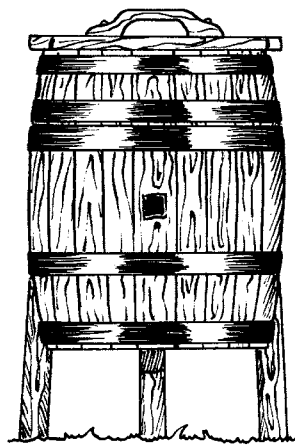
STRAW



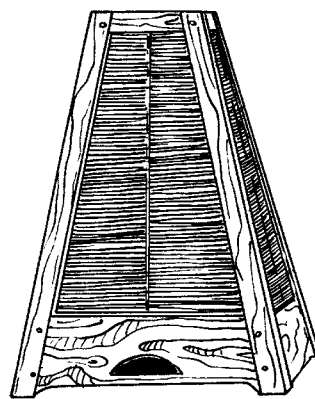
BOARDS



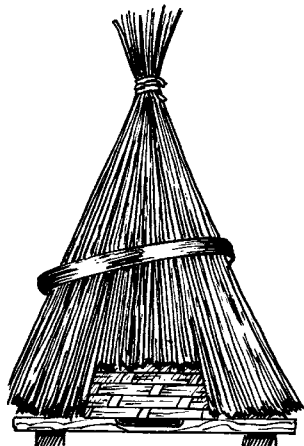
THE HIVES YOU HAVE JUST SEEN ARE ONE PIECE AND MADE EITHER FROM A TREE TRUNK OR FROM WICKER, CLAY, BRANCHES, POTTERY, CORK, STRAW, AND EVEN FENNEL. THE HARVEST FROM THESE HIVES WAS VERY LIMITED, AND PARASITES COULD EASILY SETTLE IN. IN THE 1800S, THE HIVE WITH A SUPER (OR FALSE SUPER) WAS INVENTED. IN 1814, FRANÇOIS HUBERT INTRODUCED "MOVEABLE" FRAME HIVES. TOP BAR HIVES, FIRST USED BY EARLY EGYPTIANS, WERE INTRODUCED TO THE MODERN MARKET IN THE MID-1950S.



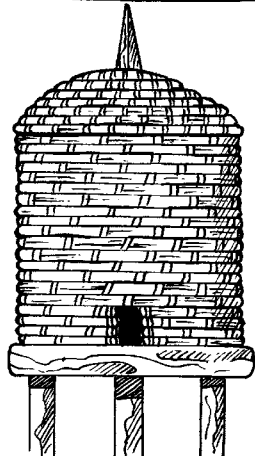
IN A BARREL



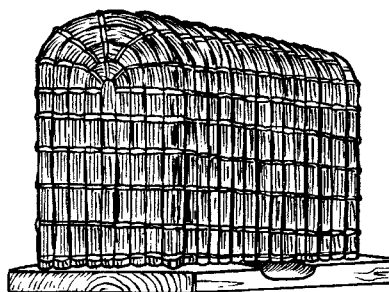
WOOD AND STRAW



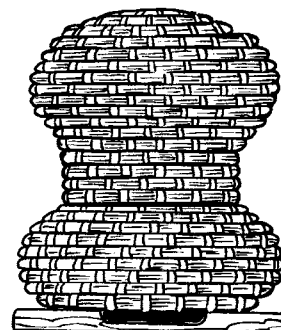
STRAW



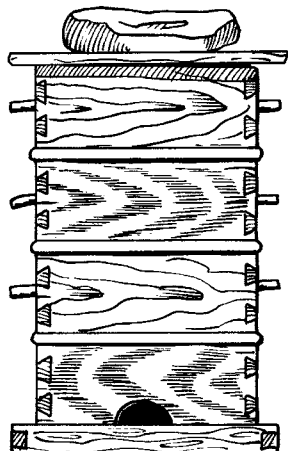
LOMBARD



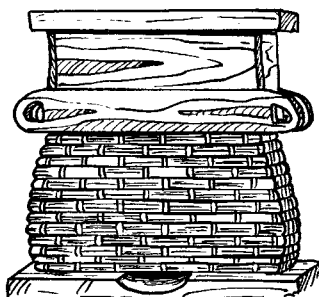
GRAVENSHORT



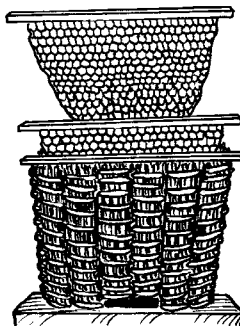
STRAW WITH SUPER



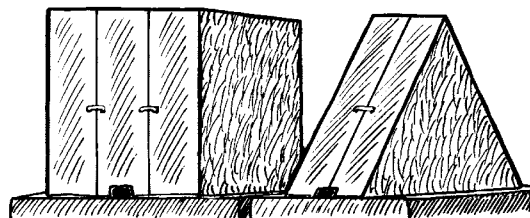
STACKED



STRAW WITH SUPER

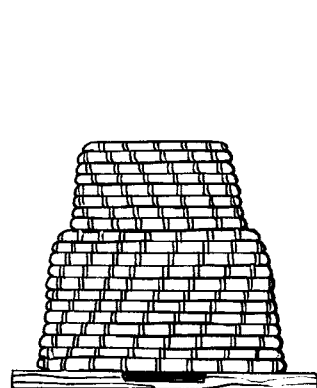


TOP BAR HIVE

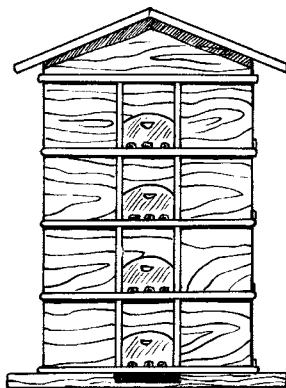


RAVENEL

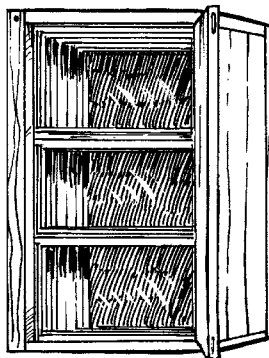
DELATRE



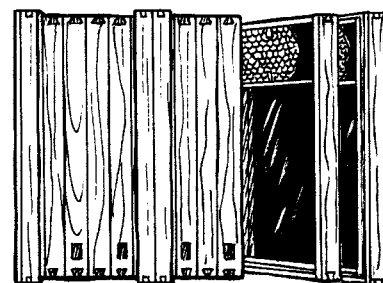
STRAW BODY AND SUPER



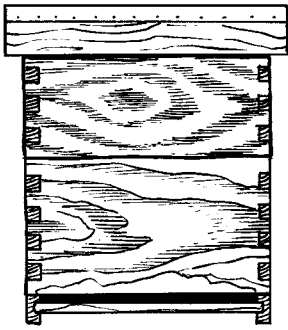
PALTEAU



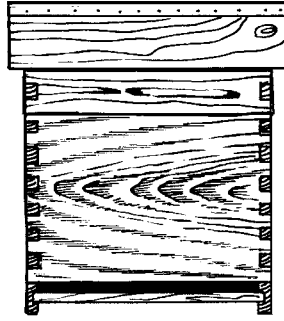
BERLEPSCH



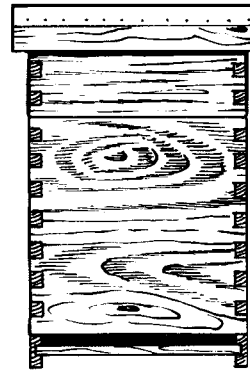
LEAF HIVE, BY F. HUBERT



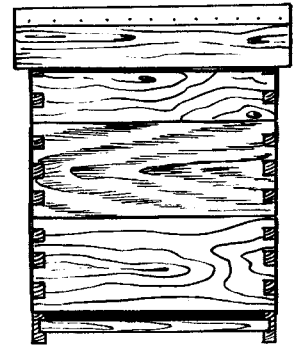
LANGSTROTH



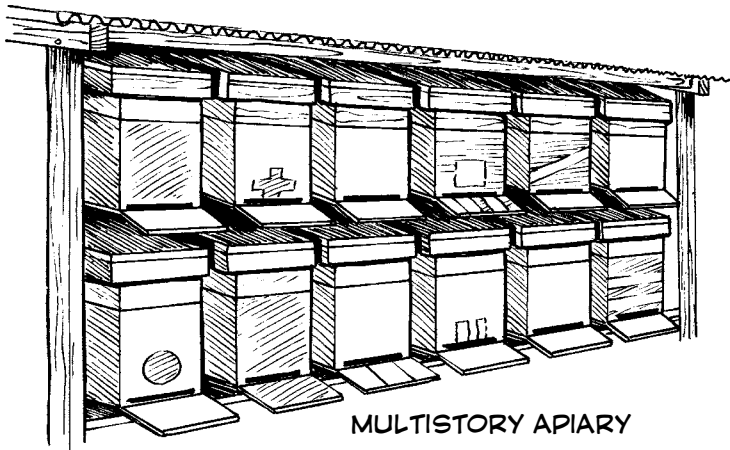
DADANT



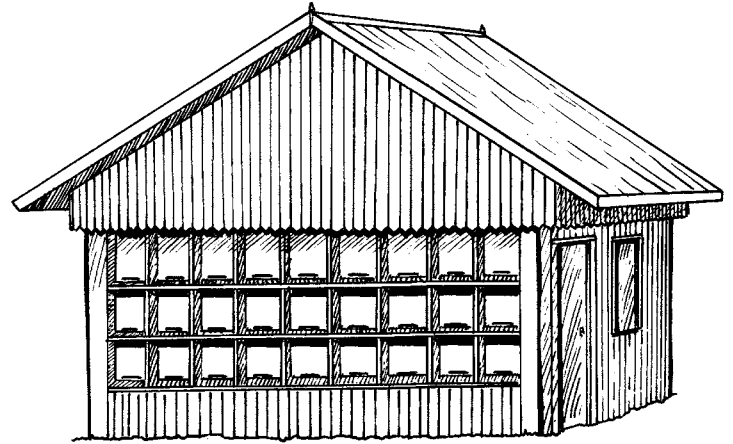
VOIRONOT



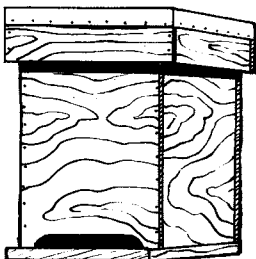
DIVIDABLE



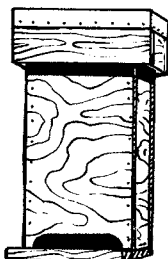
MULTISTORY APIARY



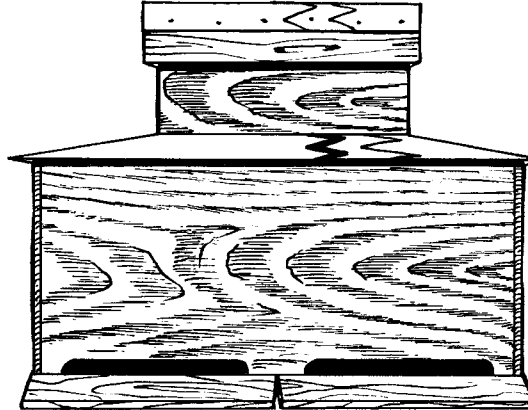
SLOVENIAN HIVE



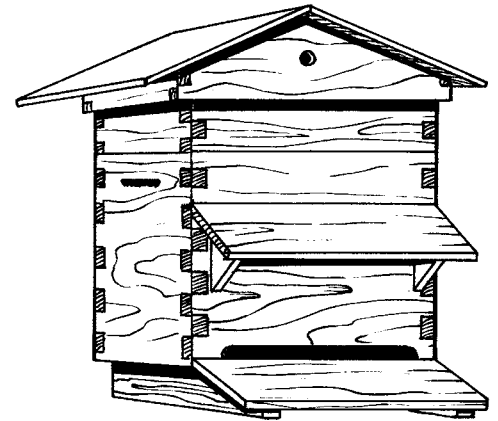
NUC BOX



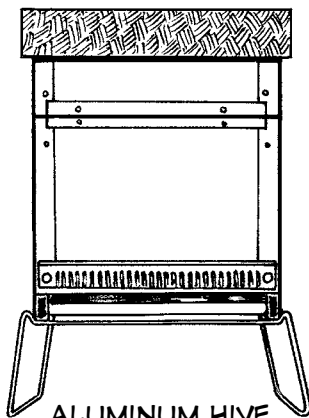
NUC



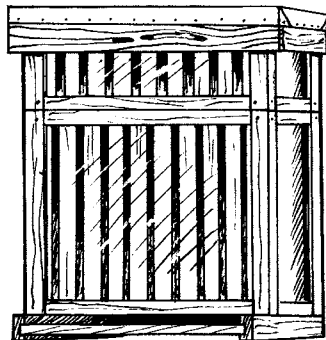
TWO-QUEEN SYSTEM



CHALET HIVE

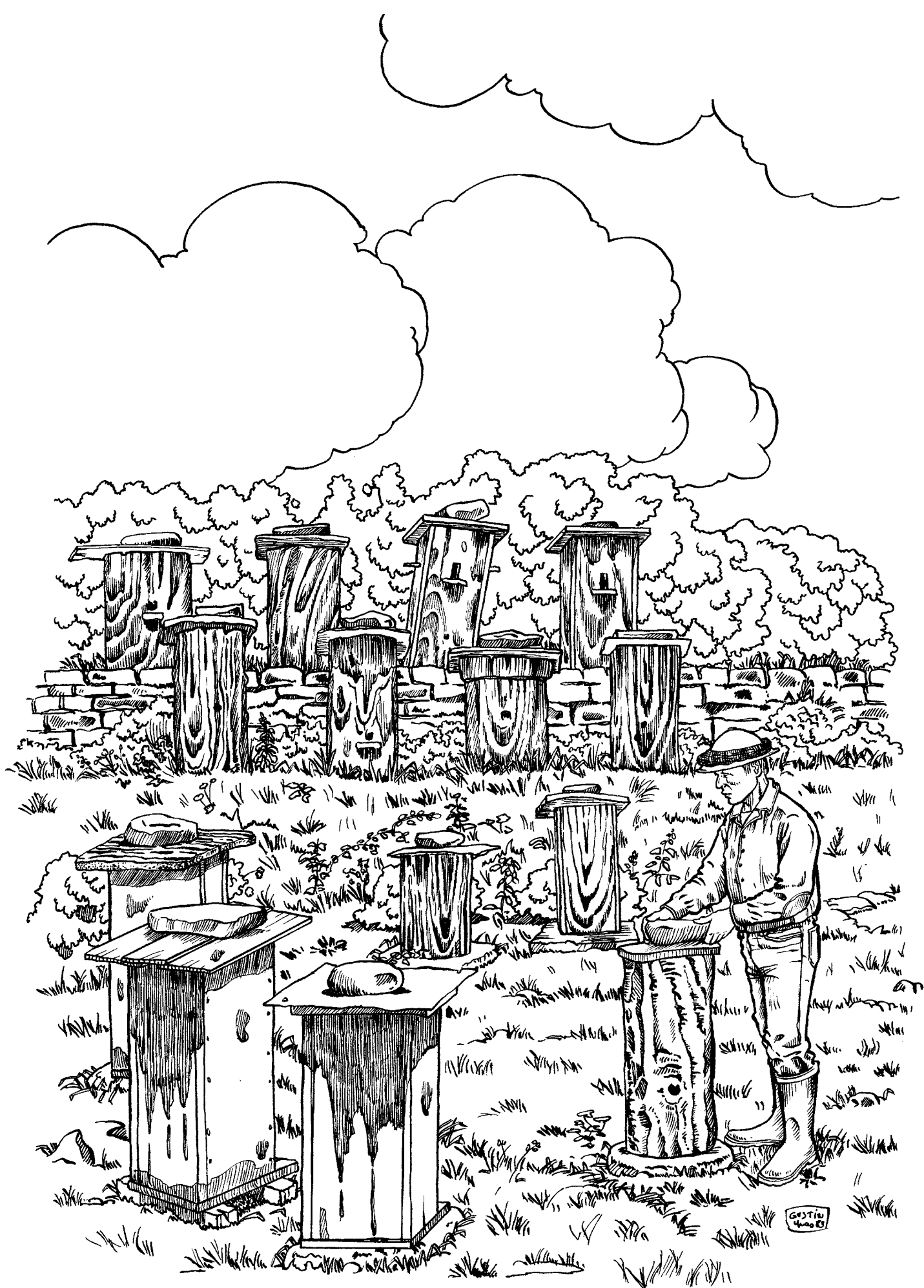


ALUMINUM HIVE



OBSERVATION HIVE

Here are the most common hives today, many found in Europe. The Langstroth consists of two identical bodies, the Dadant consists of a body and a super, the Voironot because of its structure and its volume is similar to the tree trunk hive, and the dividable has supers placed one on top of the other (very practical for swarm making). The multistory apiary and the Slovenian hive provide a maximum number of sheltered hives in a minimum of space. The nuc box is used to receive swarms and for queen breeding. The two-queen system has two colonies, which sometimes allows a double harvest. The chalet hive is popular in cold regions, and the aluminum hive is well designed but less aesthetic.



HIVE CONSTRUCTION

BEFORE STARTING BEEKEEPING, MANY OF US DREAMED OF THE PERFECT HIVES WE SEE ON INSTAGRAM OR IN CATALOGS. BUT, FACED WITH THE DIFFICULTY OF BUILDING A HIVE, SOME HAVE GIVEN UP. LET ME OFFER YOU THE OPPORTUNITY TO BRING YOUR DREAM TO LIFE, BY REVEALING SOME OF OUR MANUFACTURING SECRETS.



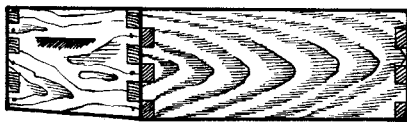
The Dadant consists of 10 or 12 frames, depending on the desired model. It's very well adapted to hot and temperate regions. Plan three honey supers for strong colonies.

I PRESENT TO YOU THE MOST COMMON MODELS: THE DADANT AND THE LANGSTROTH. THESE TWO TYPES OF HIVES ALLOW YOU TO FIND THE NECESSARY AND APPROPRIATE ACCESSORIES ON THE MARKET (SPACERS, REDUCERS, WAX FOUNDATIONS, ETC.).

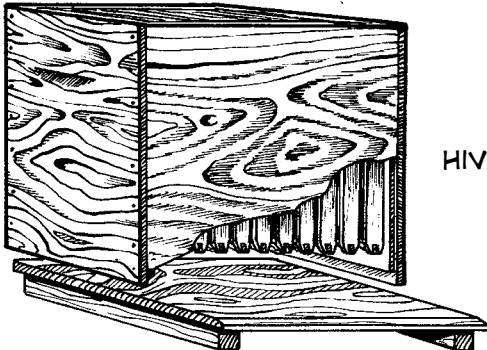
The Langstroth has identical hive body and honey super. Its volume is a little small for large populations. Some beekeepers replace the Langstroth honey supers with smaller honey supers.



OUTER COVER OR ROOF

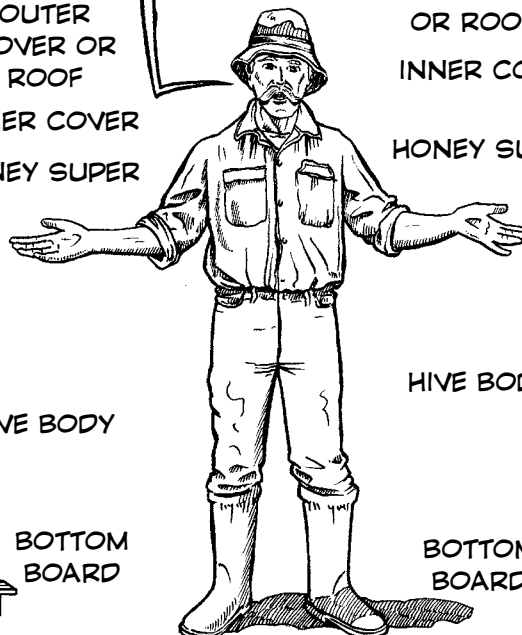


INNER COVER
HONEY SUPER



HIVE BODY

BOTTOM BOARD



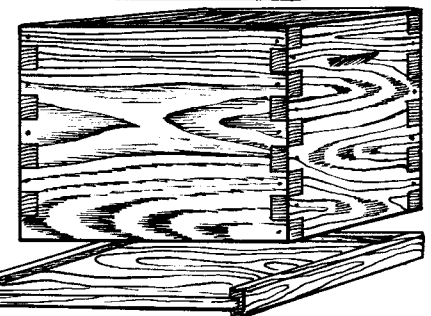
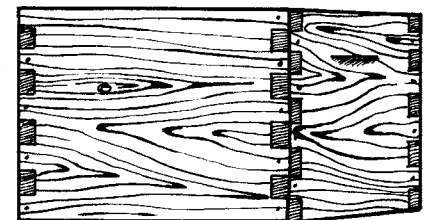
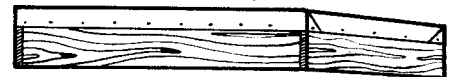
OUTER COVER OR ROOF

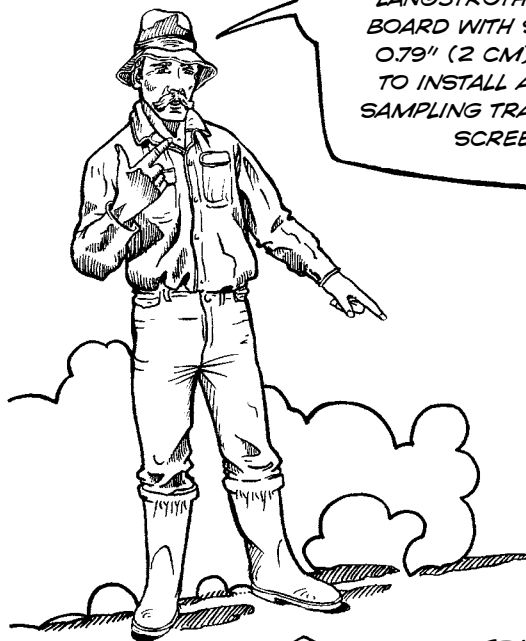
INNER COVER

HONEY SUPER

HIVE BODY

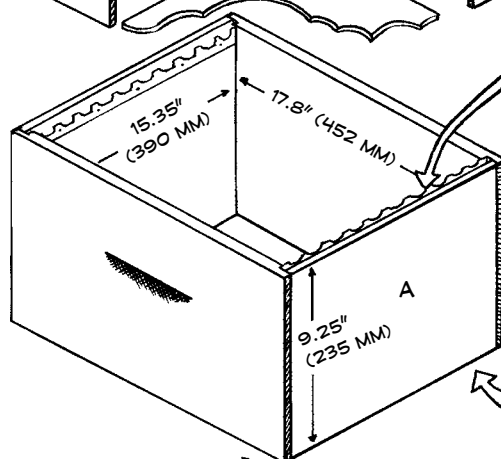
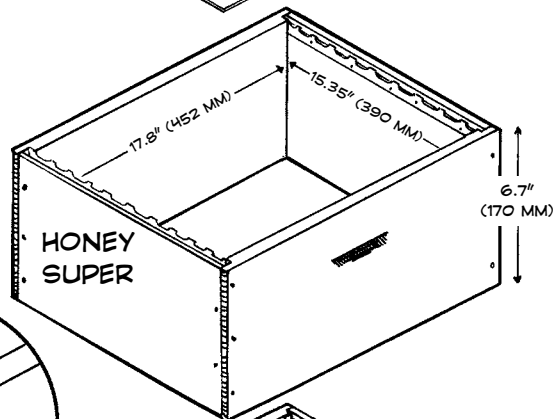
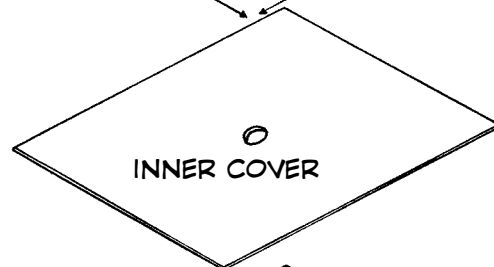
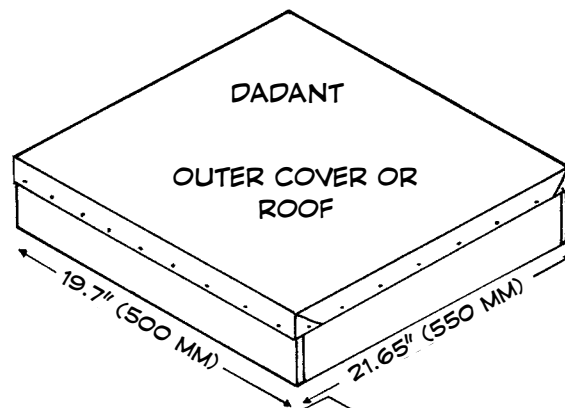
BOTTOM BOARD



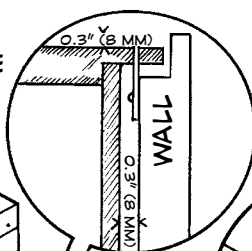


BEFORE YOU START BUILDING YOUR HIVE, CAREFULLY STUDY THE FOLLOWING TWO PLANS. THE BOTTOM BOARDS MUST BE ADAPTED FOR VARROOSIS TREATMENT. THE LANGSTROTH HAS A REVERSIBLE BOTTOM BOARD WITH SCREENED VENTILATION AND A 0.79" (2 CM) HIGH ENTRANCE TO BE ABLE TO INSTALL A SCREENED BOTTOM BOARD SAMPLING TRAY. THE DADANT HAS A SLIDING SCREENED BOTTOM BOARD.

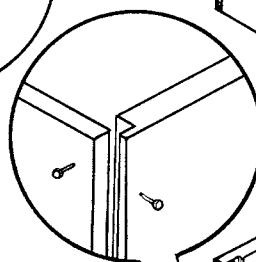
The roof is covered with aluminum sheet or offset aluminum plate. The inner cover is made of plywood, burlap cloth, plastic, etc. The internal dimensions of the Dadant or Langstroth body (width and length) are identical.



FRAME

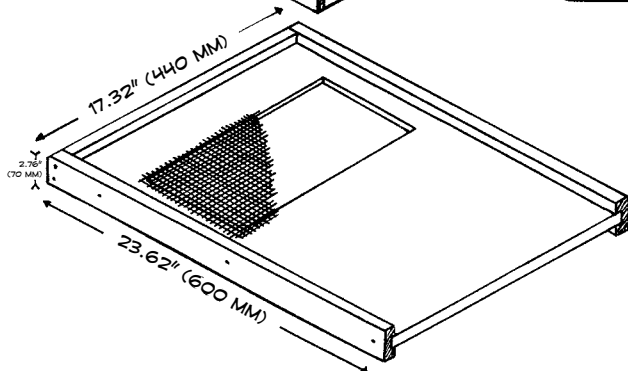
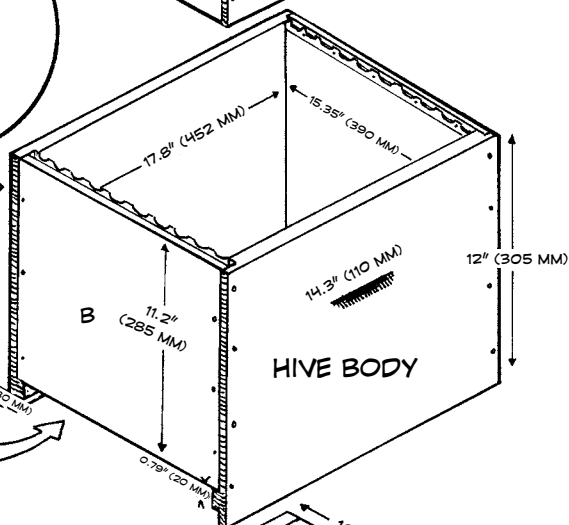
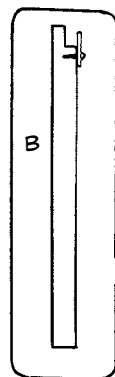
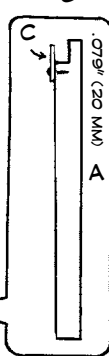


ASSEMBLING THE SIDES

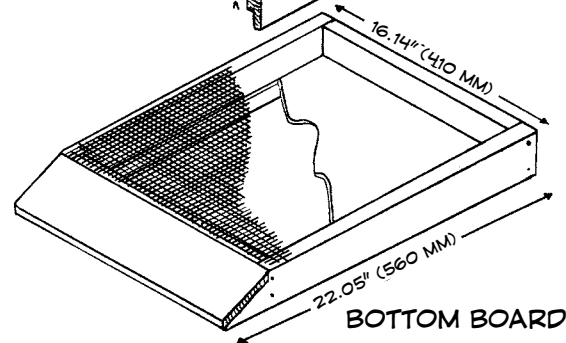


C

C: SPACER STRIP



Only the INTERIOR measurements are shown here; the outer dimensions depend on the thickness of the wood.



BOTTOM BOARD

2

FIRST OF ALL, YOU NEED MATERIALS. THE MAIN ONE IS WOOD BOARDS (PINE, FIR, POPLAR, MARINE PLYWOOD, ETC.) 1 INCH (27 MM) THICK.

THE ESSENTIAL TOOL FOR THE BEEKEEPER IS THE CIRCULAR SAW. IT ALLOWS YOU TO CUT THE BOARDS EVENLY AND QUICKLY.

A PLANER GIVES YOU A NEAT FINISH.

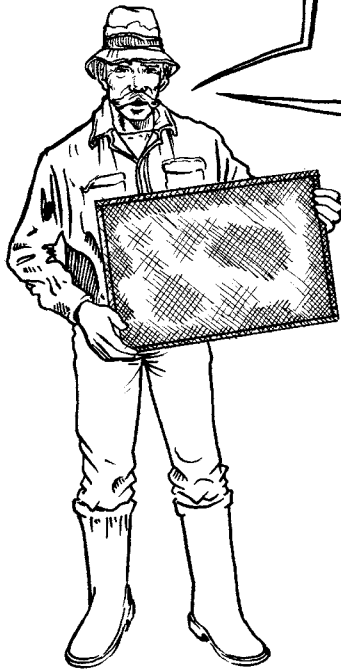
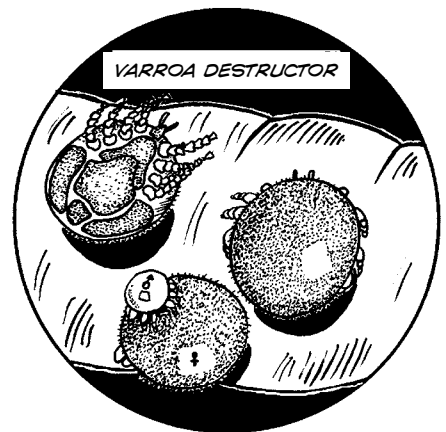
ONCE THE BOARDS HAVE BEEN CUT, NOTCHED, AND GROOVED, THEY CAN BE ASSEMBLED.

TO MAKE THE HANDLING OF THE HIVES EASIER, MY ADVICE IS TO ATTACH THE BOTTOM BOARD (WITH STAPLES, SCREWS, SLIDE FASTENERS, ETC.).

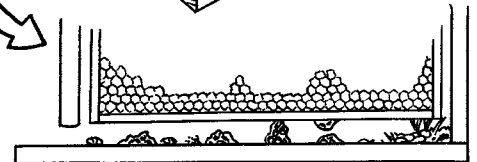
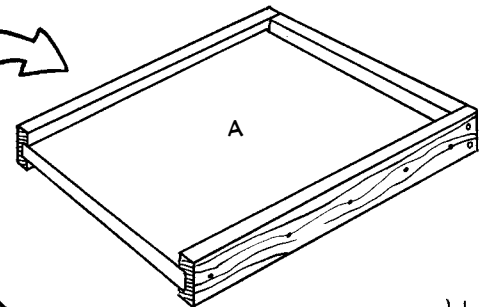
Two ways to assemble them

A PROPERLY MAINTAINED HIVE WILL LAST FOR A VERY LONG TIME. USE A PROTECTIVE COVER (ALUMINUM PAINT, LINSEED OIL, ETC.).

TO AVOID THE VARROA MITE, NEW AND OLD HIVES MUST BE MODIFIED. THE MAIN CHANGE TO BE MADE TO THE OLD HIVES IS TO ENLARGE THE ENTRANCE (0.8 IN. / 2 CM HIGH) TO FACILITATE PUSHING IN THE TEST TRAY. AS FOR THE NEW HIVES, I MAKE TWO TYPES OF BOTTOM BOARDS.

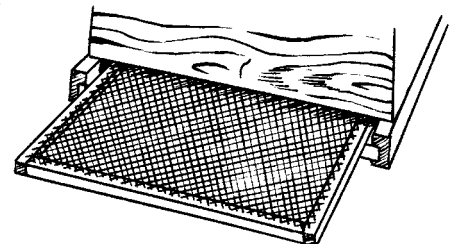
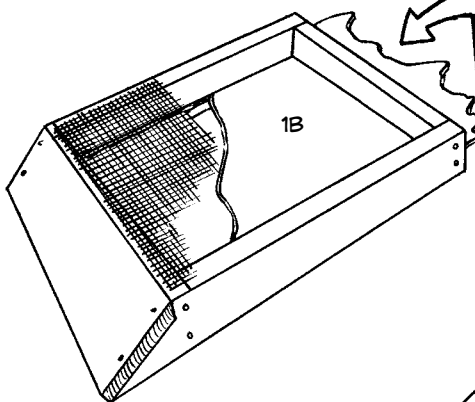


THE FIRST, (A), IS REVERSIBLE. THE ENTRANCE IS 0.8 IN. (2 CM) HIGH TO ALLOW THE TRAY TO PASS THROUGH, BUT IT HAS SOME DISADVANTAGES. INDEED, BEES BUILD AND PILE UP A LOT OF DEBRIS ON THE FLOOR; SOMETIMES, FRAMES COLLAPSE, MICE NEST IN IT, ETC., WHICH AFTER A WHILE OBSTRUCTS THE PASSAGE OF THE TRAY. THE BEEKEEPER MUST CLEAN THE BOTTOM BOARD REGULARLY AND FREQUENTLY.

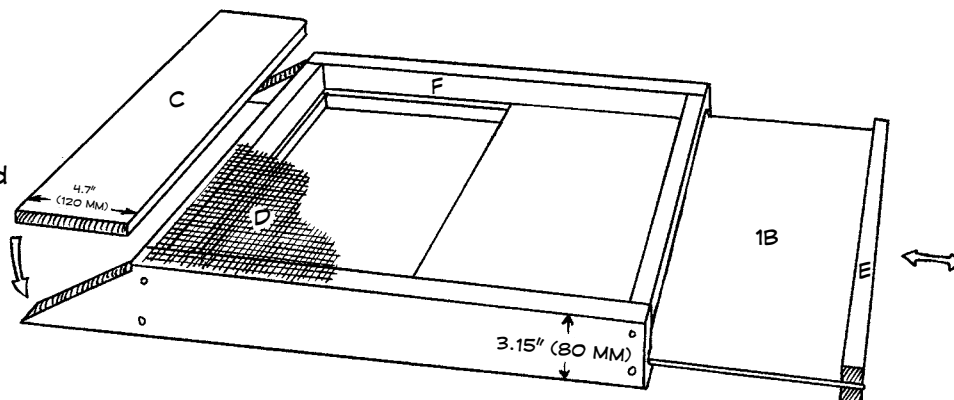


Bottom board obstructed by buildup that prevents the tray from being placed

THE SECOND, (B), IS EQUIPPED WITH A WIRE-MESH BOTTOM THAT ALLOWS VARROA MITES TO FALL THROUGH AND STICK TO OIL OR STICKY PAPER ON THE TRAY (1B). IT ALSO PROMOTES GOOD VENTILATION OF THE HIVE. MANY BEEKEEPERS HAVE ADOPTED THIS FORMULA AND ARE HAPPY WITH IT. IS THE SAME TRUE FOR BEES?



- 1B: 0.25" (5 mm) plywood
- C: 0.5" (15 mm) board
- D: Fine mesh
- E: 1" x 1" strip (25 x 25 mm)
- F: Groove



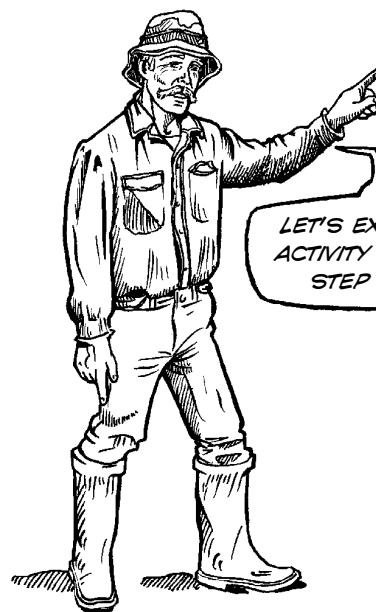
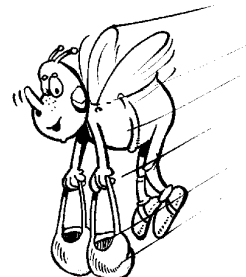
THE ACTIVITY OF A HIVE

LET'S NOW ENTER A BEEHIVE IN FULL ACTIVITY, HERE A MODEL
DADANT. THERE ARE THREE PARTS:



-A BODY WITH 10 FRAMES, INCLUDING THE OUTSIDE FRAMES
(CONTAINING HONEY AND POLLEN) AND THE CENTRAL FRAMES (FILLED WITH
BROOD OF ALL AGES). THIS SITUATION REMAINS THE SAME ALL YEAR ROUND,
EXCEPT DURING THE WINTER MONTHS WHEN BEES CLUSTER.
-A SUPER (TWO OR THREE FOR VERY STRONG COLONIES) WITH NINE
FRAMES THAT WILL BE FILLED WITH HONEY AND POLLEN DURING THE
VARIOUS NECTAR FLOWS
-A ROOF TO PROTECT THE HIVE FROM THE ELEMENTS AND UNDER WHICH
A FEEDER CAN BE PLACED FOR THE WINTER (FEEDING IS DONE WHEN THERE'S
NO HONEY SUPER ON).

1. Aluminum sheet
2. Roof
3. Inner cover
4. Feeder (placed here only for needs of the illustration). It can be replaced by bee candy in the winter.
5. Spider (some are good predators against wax moths)
6. Super placed for honey harvesting
7. Cell full of pollen
8. House bee depositing the nectar
9. Queen surrounded by her court
10. Male or drone. It warms the brood in early spring. Its main function is fertilization of the queen.
11. Hive wall
12. Drone cells
13. Eggs
14. Brood. The frames of the center are filled with it.
15. Worker bees building honeycomb
16. Queen cells
17. Festooning bees
18. Larvae
19. Water collector bee
20. Young guard bee
21. Ventilators
22. Guard
23. Forager
24. Entrance



LET'S EXAMINE THE
ACTIVITY IN THE HIVE
STEP BY STEP.



