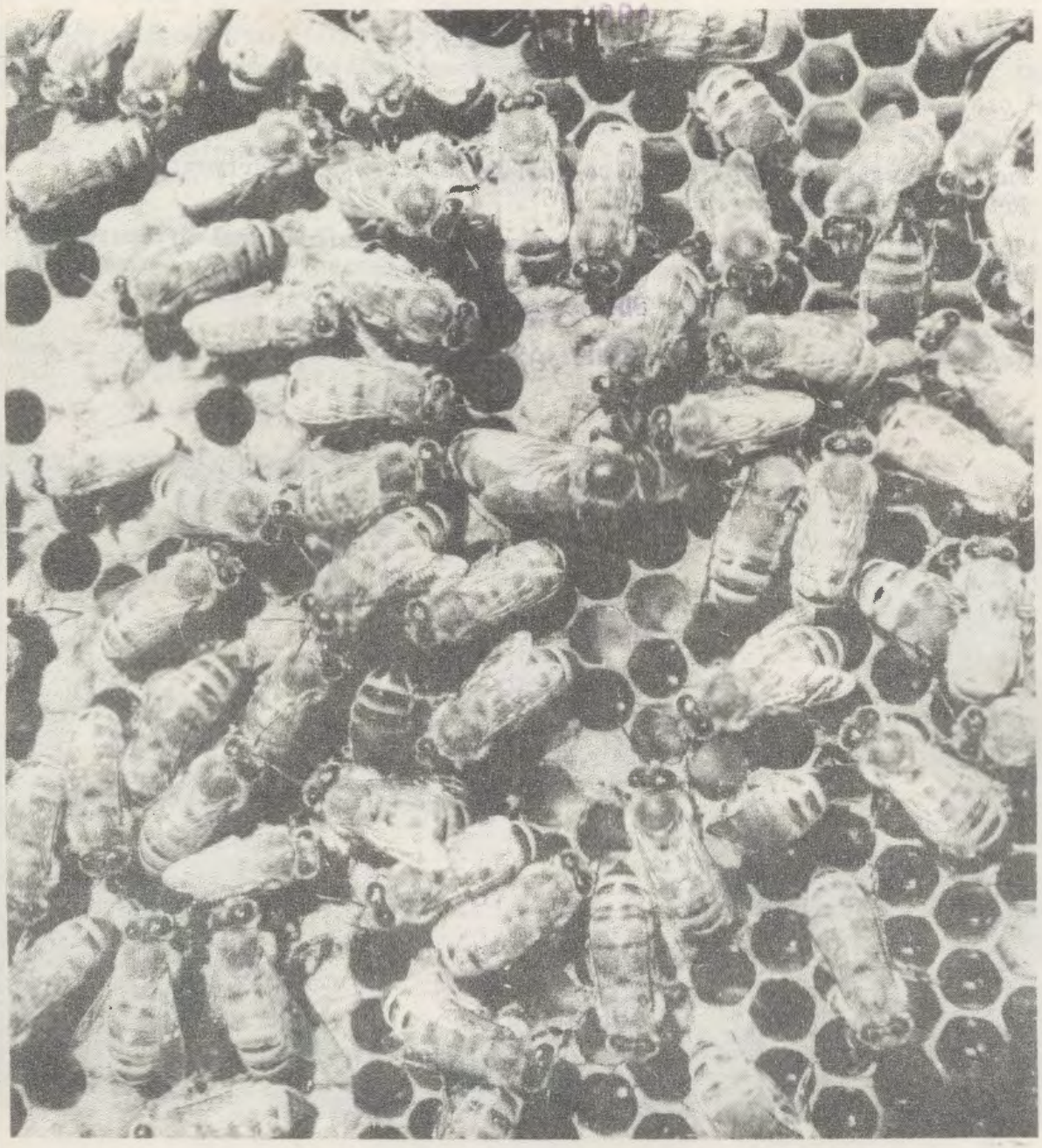
BEEKEEPING



DEPARTMENT OF PRIMARY INDUSTRY
PORT MORESBY
1982

Further issues will be added to the series by the Department of Primary Industry, as required.

To obtain copies of these booklets, ask your agricultural officer, or write to -

Secretary
Department of Primary Industry
P O Box 417
Konedobu

BEEKEEPING

INTRODUCTION

Papua New Guineans keep bees to make honey (sweet yellowish liquid) used by people as a food. It can be used in place of sugar and is a better food than sugar.

Bees go from flower to flower collecting nectar (sugary liquid produced by plants) and pollen (fine grains found upon the male part of the flower). The nectar and the pollen are taken back to the hive. The nectar is made into honey and is stored in cells (small divisions in the honeycomb). The bees use the honey as their main source of energy food. The pollen is also stored and is used for their protein food. Pollen is a good protein food for people as well.

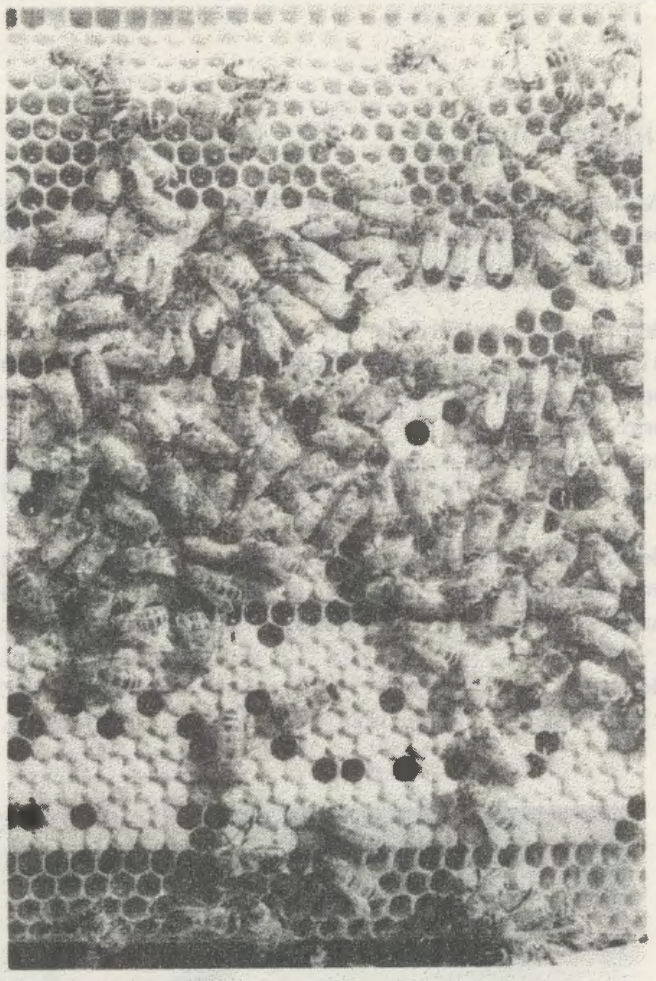
Bees carry pollen grains from the male part of one flower to the female part of another flower. This is necessary in order for the plant to make fruit that will have seeds. This is very important for crops such as fruit trees.

Beeswax is a sticky yellowish material produced by bees to make their honeycombs. It is used in making lipsticks, polishes, candles, etc.

A bee collecting nectar and pollen

Bees in Papua New Guinea do best at the altitudes between 1200 metres (m) and 1800 m. Above and below these altitudes one can still keep bees but there may be problems. Less honey may be produced or the quality of the honey may be low.

The recommended type of bee for honey production is called the Italian Honey -bee *Apis mellifera.* It is brown in colour and usually has four stripes around the abdomen. These bees live together in a colony (community of bees) and depend on each other for living.



These bees are busy working with their honeycomb

The Department of Primary Industry (D.P.I.), Goroka, in the Eastern Highlands Province is now the distribution centre for all materials, equipment and the colonies of bees that are needed to start a project.

At Mt. Hagen, there is a bee research project to get more information about the best ways of keeping bees in the highlands. Results from the research project at Moitaka near Port Moresby proved that bees kept at lowland altitudes and climatic conditions cannot produce enough good quality honey.

STARTING A BEE PROJECT

If you are interested in keeping bees for profit, work with an experienced bee-keeper for at least a year to gain some experience.

If you are interested in keeping bees for your own use, then buy one hive or more. A Bee Extension Officer will help you at your place if you live in the Eastern or Western Highlands. Otherwise you can write to the Bee Section, Department of Primary Industry, P.O. Box 766, Goroka, for advice.

Taking a wild bee colony and keeping it is not encouraged because the bees are harder to work with and they might be carriers of some sicknesses.

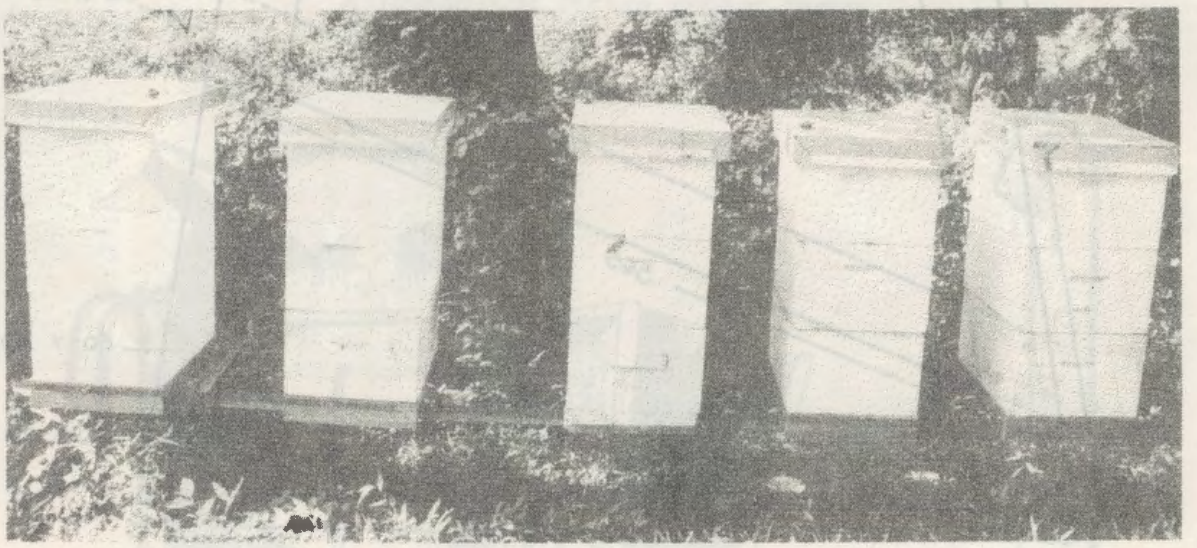
If you are good at making things from wood, make the hives yourself using the measurements given in the last few pages. Otherwise buy bees in already made hives from D.P.I., Goroka. If you make the hives yourself, take them with you when you go to D.P.I., Goroka, to get your bees.

If you buy your bees from the Department of Primary Industry, you will be registered as a beekeeper. If you buy beehives from some other source, then make sure you get registered with the Department of Primary Industry. In this way a Bee Extension Officer can keep an eye on your bees for any sickness.

WHERE TO KEEP THE BEEHIVES

Keep the hives in a place where you can easily go and work with them. This place must be free of other animals such as pigs, dogs, cattle, etc. because the smell of animals makes the bees angry. If you are keeping bees as a business, a road leading to your hives is helpful. To avoid anyone getting stung keep the bee-hives away from roads, buildings and places that people use a lot. Keeping bees should not spoil your relationship with your neighbours and the public.

If you want to keep bees in town, check the town rules first. Place the beehives on stands beside a tall fence. Remember to keep the hives inside the fence. The bees will fly high in order to cross over the fence before coming into their hives. In this way the bees won't sting other people who will be using the near by roads, buildings and places. Hives can also be kept on top of a shed to prevent the bees from stinging other people.

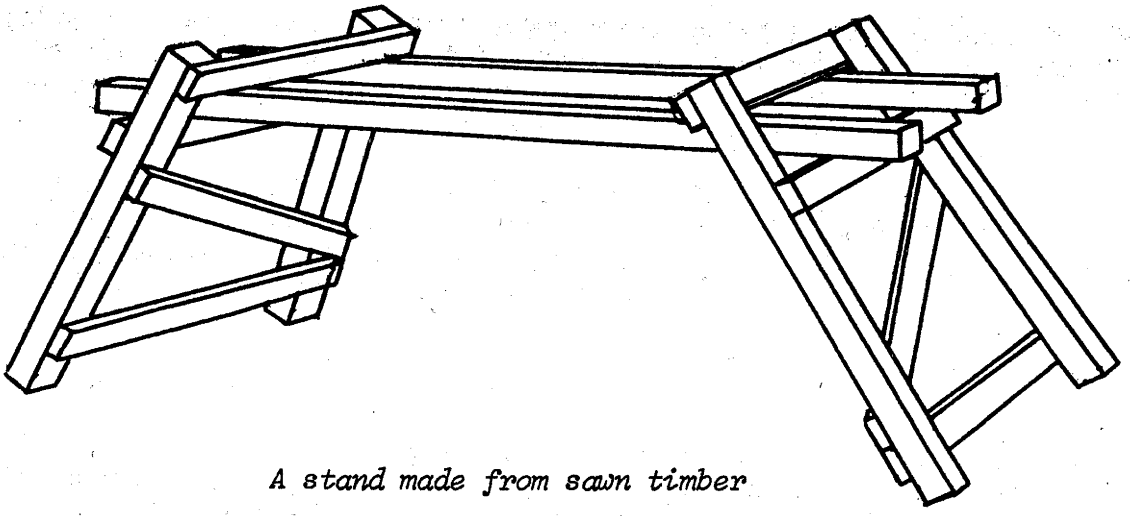


These hives are kept on top of a metal stand

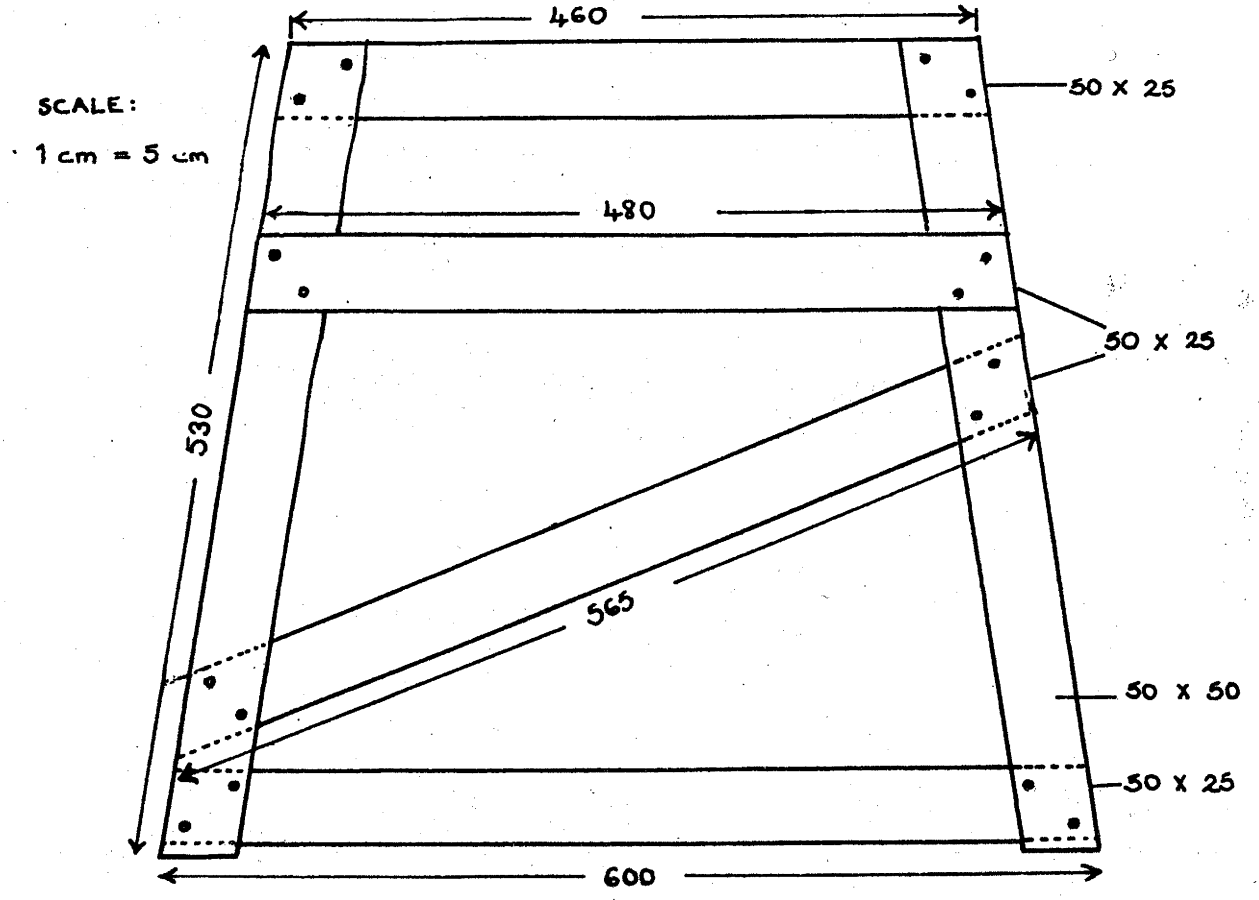
HOW TO MAKE A HIVE-STAND

Parts of wood stands can be bought from D.P.I., Goroka. These parts are put together to make the stands but you must pay for them. It might be cheaper for you to make the stands out of bush or sawn timber.

Build the stand 40.6 centimetres off the ground. Use good sized bush timber or use 5 x 5 centimetre size sawn timber. Cut out the pieces for the two end parts of the stand using the measurements given in the diagram. To make these end parts, nail the pieces together. Put the two long pieces of timber through the two end parts. The stand is now ready for putting the hive on top.



A stand made from sawn timber

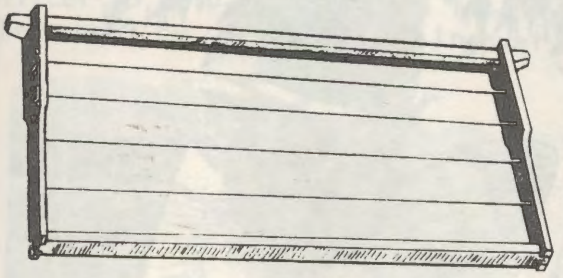


This diagram shows you how to make an end part of a stand

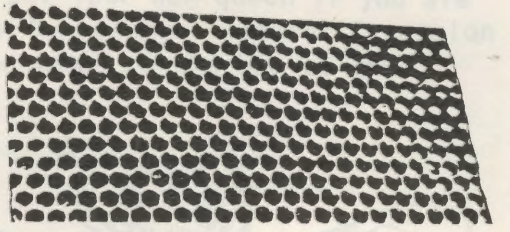
BEEKEEPING EQUIPMENT

Buy the following equipment at the same time that you buy your bee colonies: *Hives*, to house your bees, *frames*, to fit into the hives to support the honey-combs, *foundations*, that fit into the frames. The bees use the foundations as their base to make cells from. They use the cells to store the honey and to raise the young bees.

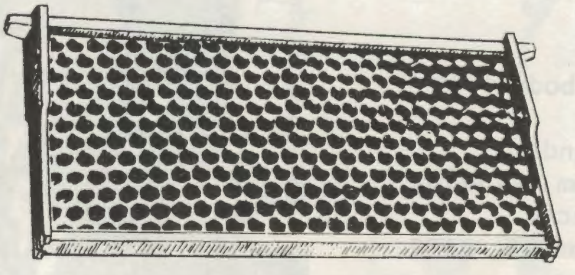
Buy a *smoker*, to blow smoke into to the hives to quiet the bees before you work with them. Also buy a *hive tool*, to help you separate the frames to check the bees or to harvest the honey.



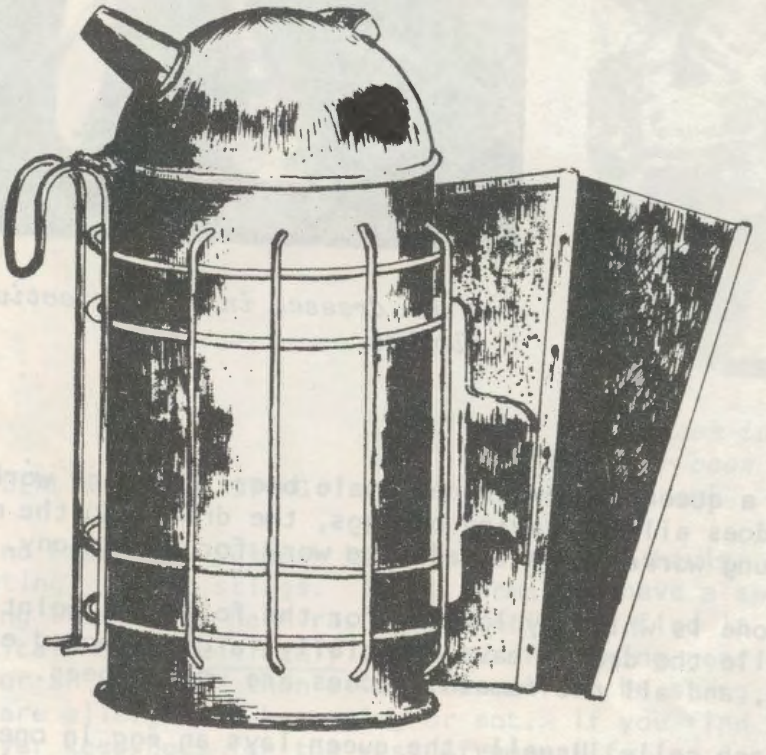
A frame

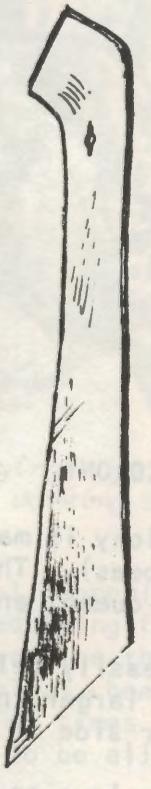


A foundation



A foundation fitted into a frame





A smoker and a hive tool

As a new beekeeper you need to have the following protective clothes. Buy them on the same day you buy your bees. This protective clothing includes the following items:

Overall, to protect your body from bee stings.
Gloves, to cover your hands.
Veil, to stop bees from stinging your face and neck.
Hat, to stop them from stinging your head.
Shoes, for covering your feet.

A man dressed in his protective clothes

THE BEE COLONY

A bee colony is made up of a queen, a few drones (male bees) and many worker bees (female bees). The queen does all the laying of eggs, the drones do the mating with the queen, and the young worker bees do all the work for the colony.

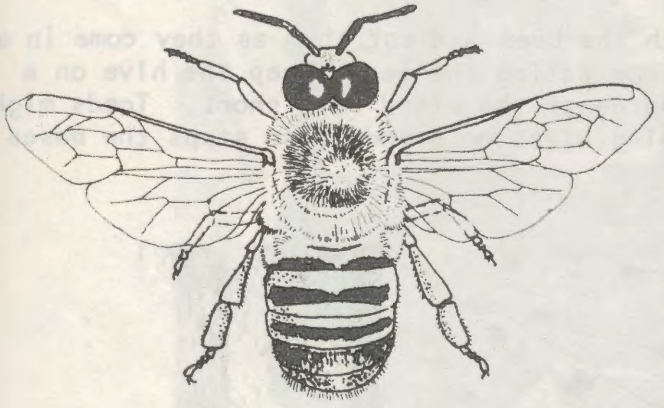
You can easily tell which one is which by looking for the following points. The queen is larger in size while the drones have especially large compound eyes, one on either side of the head, and all the remaining ones are worker bees.

The queen lays an egg in each cell. Usually the queen lays an egg in one cell after another. If she lays eggs in any cell she likes, leaving empty cells all over the honeycomb, then this disorderly laying of eggs shows that a new queen is needed.

At this time buy your new queen from D.P.I., Goroka and replace the old one. Ask your Agricultural Extension Officer to help you to get your new queen if you are living far away from D.P.I., Goroka. Also ask your Bee or Agricultural Extension Officer to help you with the introducing of the new queen to the bee colony. There must be one queen bee in every hive.

A queen bee

A worker bee



A drone

The queen is busy laying eggs while the worker bees are busy working with their honeycomb

HOW TO DEAL WITH BEE STING

So far no Papua New Guinean has been allergic (having an unusual happening after a bee sting) to bee stings. It is normal to have a swelling resulting from a bee sting but if you have rashes, fainting or find it hard to breathe then seek for medical help immediately. If you are living near to a hospital, health centre or an aidpost, then allow yourself to be stung a couple of times to see if you are allergic to bee sting or not. If you find yourself to be allergic then never keep bees for the rest of your life.

Allergic people are usually given adrenalin at their place of medical help.

If you get stung by a bee, scrape off the sting immediately before it has time to push more poison into your skin.

WHEN TO WORK WITH THE BEES

Work with the bees only when you feel you need to. Looking into the hive every day is not a good idea because bees work the best when they are left alone. Also you are likely to squash the queen if you move the frames very often.

Work with them between 10 am. and 3 pm. During this period most of the oldest bees, those that are likely to sting, are away from the hive and the returning ones are busy as they are loaded with nectar and pollen.

SICKNESSES

At the moment there is no serious bee sickness in Papua New Guinea but you must always remember to register yourself as a beekeeper with the Department of Primary Industry. If you are registered, a Bee Extension Officer will keep an eye on your bee colony for any sickness.

PESTS

Asian toads ("Rokrok")

Asian toads known as "Rokrok" will catch the bees and eat them as they come in and go out of the hive. To prevent toads from eating the bees, keep the hive on a stand. Also keep the grass that is underneath the stand very short. Toads might not be a problem at your place but keeping hives on stands also stops the bases of hives from rotting.

Asian toads will catch the bees and eat them as they come in and out of the hive

Wax-moths

Wax-moths eat the honeycomb.

To stop them from eating the honeycomb, keep the hive lid closed at all times unless you are with the hive. Also the hive should not have extra space that is not being used by the bees.

Ants

Ants will take away the honey and the developing young bees.

Keep your hive on a stand. Grease the legs of the stand with the kind of grease that is used in greasing parts of vehicles such as cars. This will keep the ants away from the hive.

Grease the legs of your hive-stand to prevent ants from going into the hive

WORKING WITH THE HIVE

Be careful not to upset the bees

Remember these points before working with the beehive. Your body and the protective clothes should be clean because dirt upsets the bees. Make sure no other animals are near to the hive because the smell of animal makes the bees angry. Do not wave your arms, and always work from the side of the hive. Be careful not to bump into the hive.

Use a smoker to quiet the bees

As a fuel for your smoker use a piece of coffee bag, corn cobs, or dry wood shavings. Any of these you find handy can be used.

Light a piece of news paper and use this lit paper to light your fuel. Put your fuel in the smoker and close the lid. Squeeze the bellows (see picture) to keep the fire going and to make smoke.

Squeeze the bellows of the smoker to encourage fire and to make smoke.

Blow three or four good puffs of smoke at the door of the hive. Wait for half a minute, give the guard bees at the door of the hive another puff. Next lift the the inner and the outer lids slowly while gently puffing smoke into the hive. Take the lids off and put them aside. Use the hive tool to separate the frames. Take the last end frame and put it outside to allow enough space for you to work with the other frames. When you have finished checking the rest put the end frame back into the hive. In all that you do be careful not to squash the queen bee.

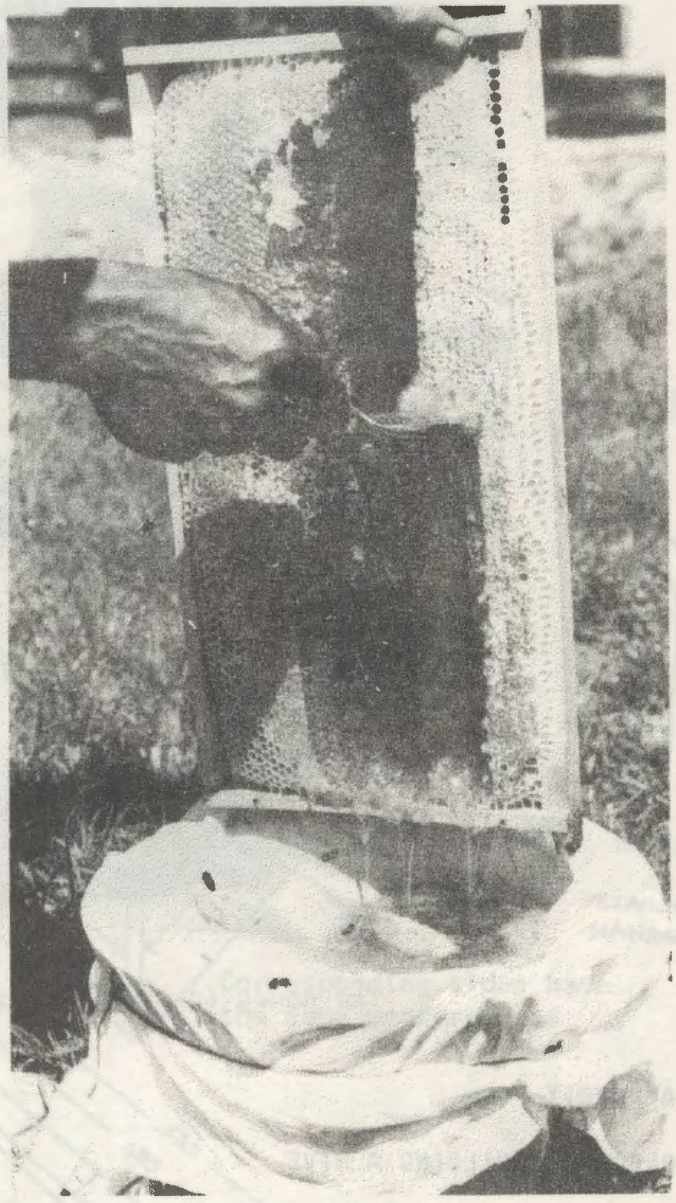
Before you work with the bees, use the smoker to quiet them.

HOW TO REMOVE THE HONEY

If the top of the cells are covered with wax, this shows you that the honey is ready for removing. Only take extra honey or the honey that is not needed by the bees. In a strong colony of bees, leave six full frames of honey for them to eat.

If you live in Goroka and have one hundred or more hives, you can pay to use a machine to remove the honey from the combs. The machine will remove only the honey without damaging the combs. If this type of of machine is not available, you can use the method explained below even though it takes more time.

This method is used by people who live in villages where there is no machine near by or they have few hives. All you need is a container such as a bucket or a saucepan, a piece of nylon cloth or fly wire, a piece of string or rope and a spoon. Cover the mouth of the container with the cloth and tie it on to the container with the string. The cloth will allow only the honey to drop into the container and hold back bits and pieces of the combs. Scrape off the comb together with the honey and at the same time be careful not to make a hole in the foundation. Pour the honey into an air tight container for storage, or it can be eaten fresh.



Hand method of removing the honey from the comb

When you have finished removing the honey, put the frames back into the hive and put the lids on. The bees will again make new cells and fill them with honey.

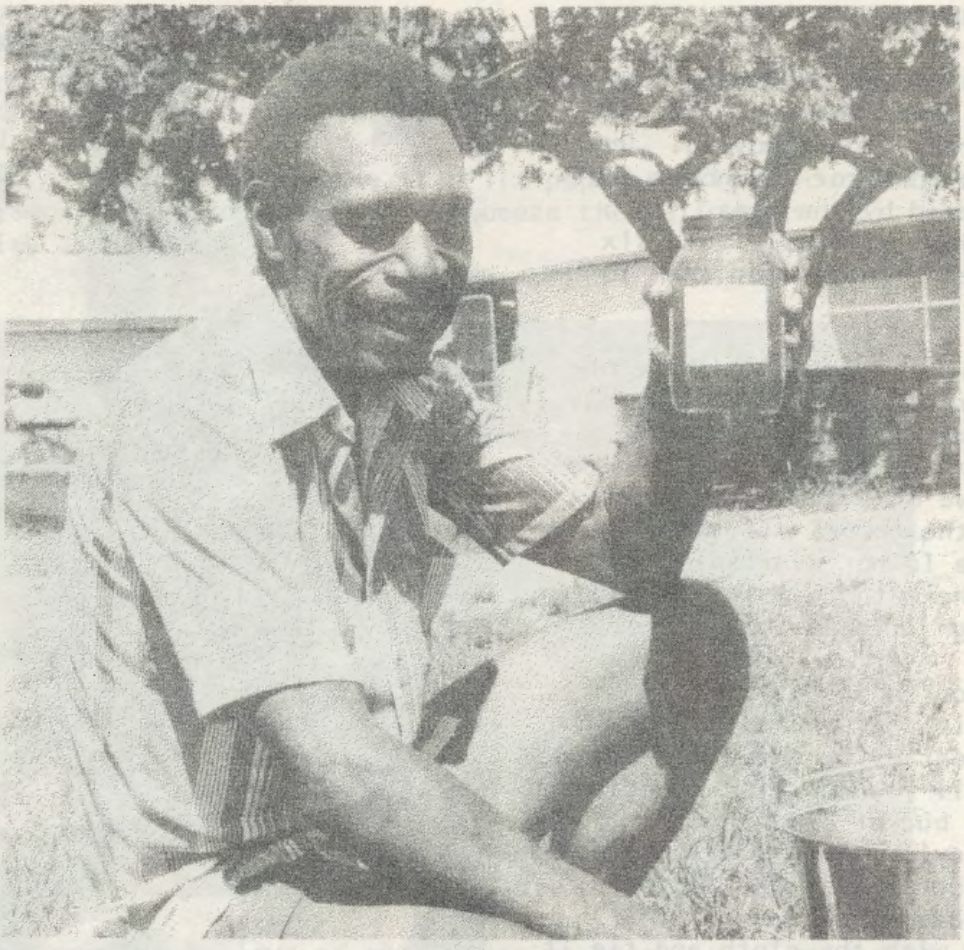
STORAGE

Honey can be stored for a long time if it is packed in an air tight container such as a jar with an air tight lid.

MARKETING

Eat the honey with your family first. Sell the left over honey at the local market. Marketing should not be a problem if you are producing large amounts of honey. The honey packaging plant in Goroka will buy your honey if it is in a clean container and is in good condition.

This honey packaging plant will soon be set up. Here the honey will be put into air tight containers and these will be sold to stores.



The honey is being put into an air tight jar

APPENDIX

PLAN FOR BUILDING A HIVE

It is very important that you use the exact measurements given in the plan when you are building a hive. Wrongly built hives with wrong measurements result in too little or too much space in the hive. Too little space in the hive means a loss of beespace and too much space allows predators to get into the hive and eat the bees.

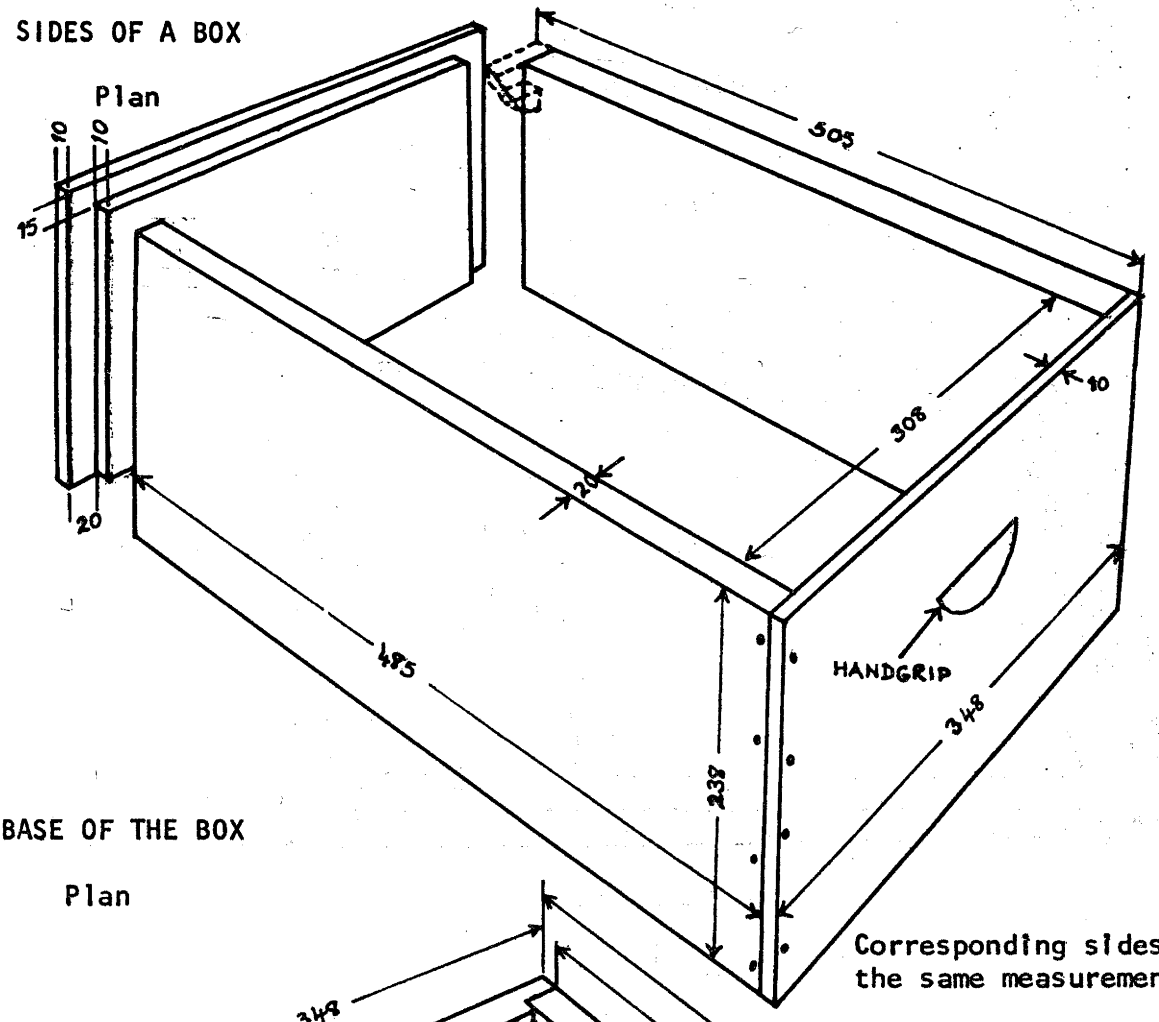
Use galvanised or cement coated nails.

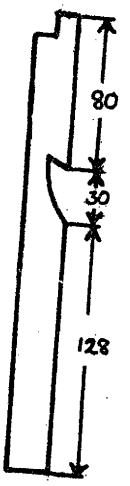
The measurements given in the plan are all in millimetres (mm). The hive plan is not drawn to scale.

HIVE

SIDES OF A BOX

Plan

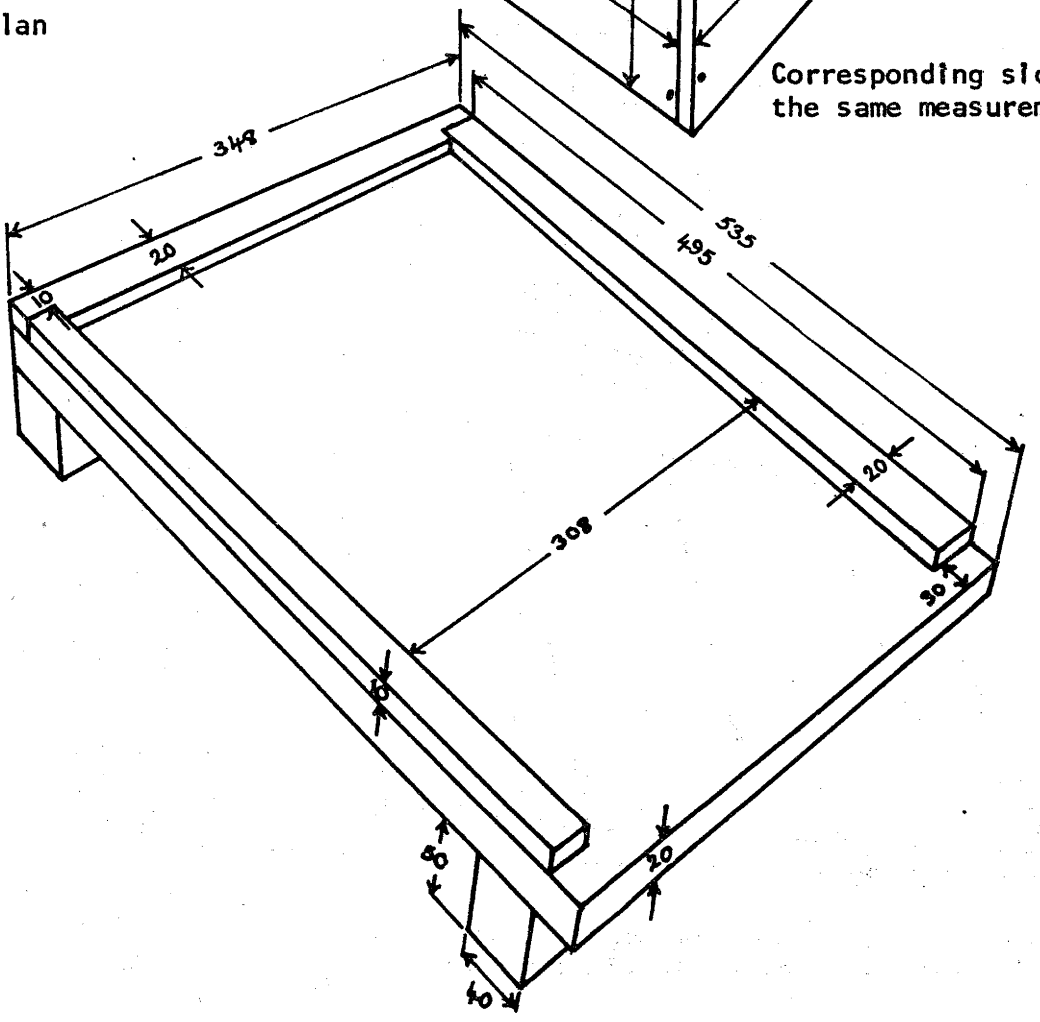




DETAIL OF HANDGRIP

BASE OF THE BOX

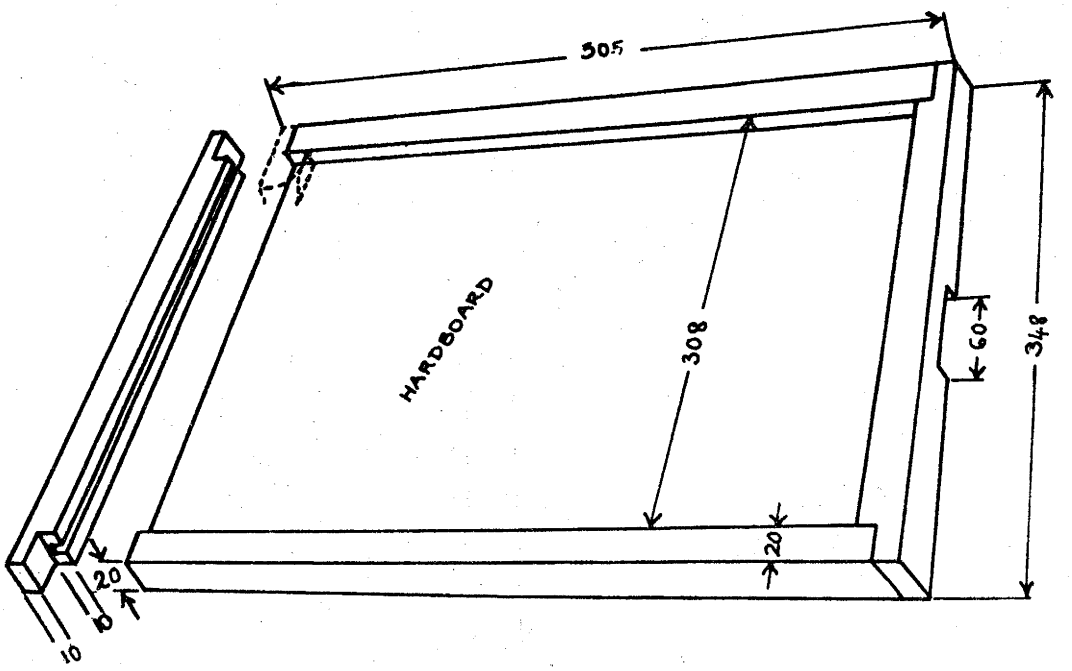
Plan



Corresponding sides have the same measurements

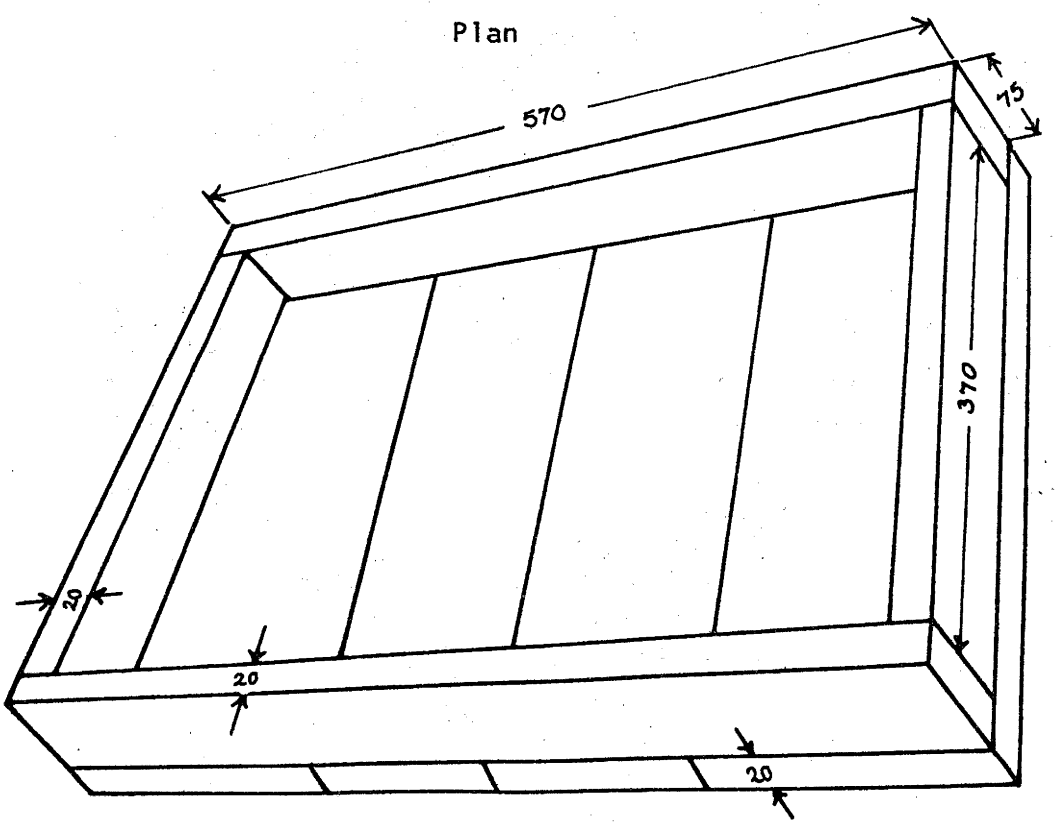
INNER LID

Plan



OUTER LID

Plan

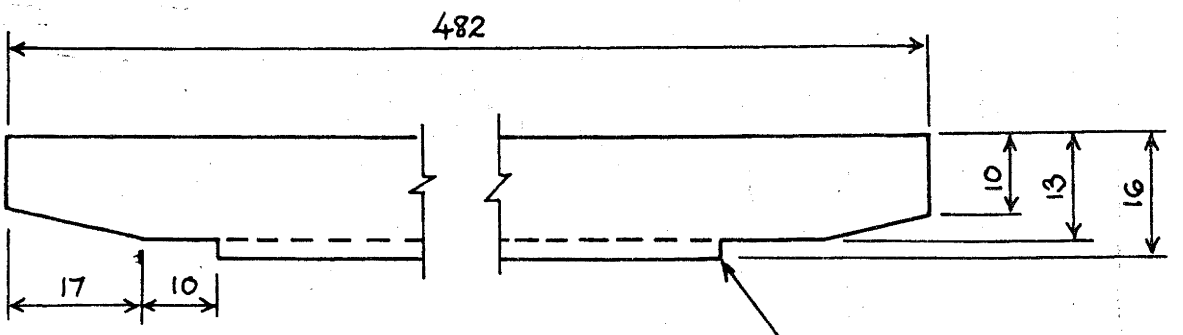


FRAME

Scale 1 mm = 1 mm

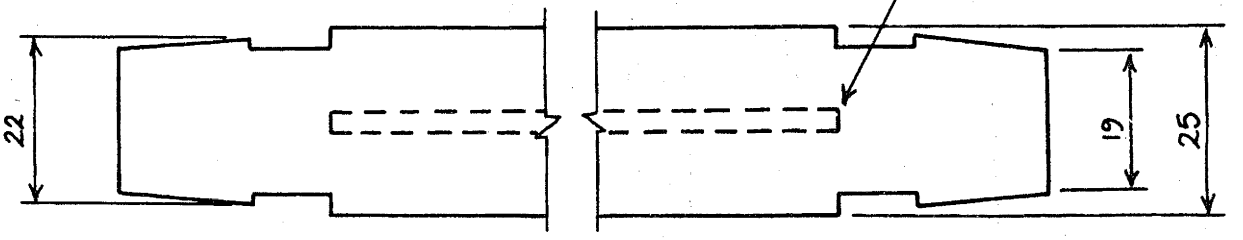
TOP BAR

Elavation



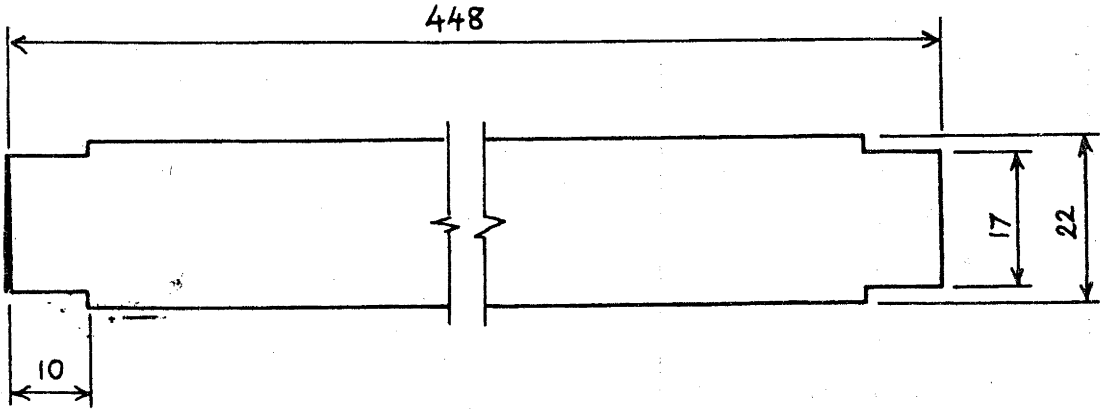
Groove cut along bottom centre- 3 mm deep by 3 mm wide

Plan



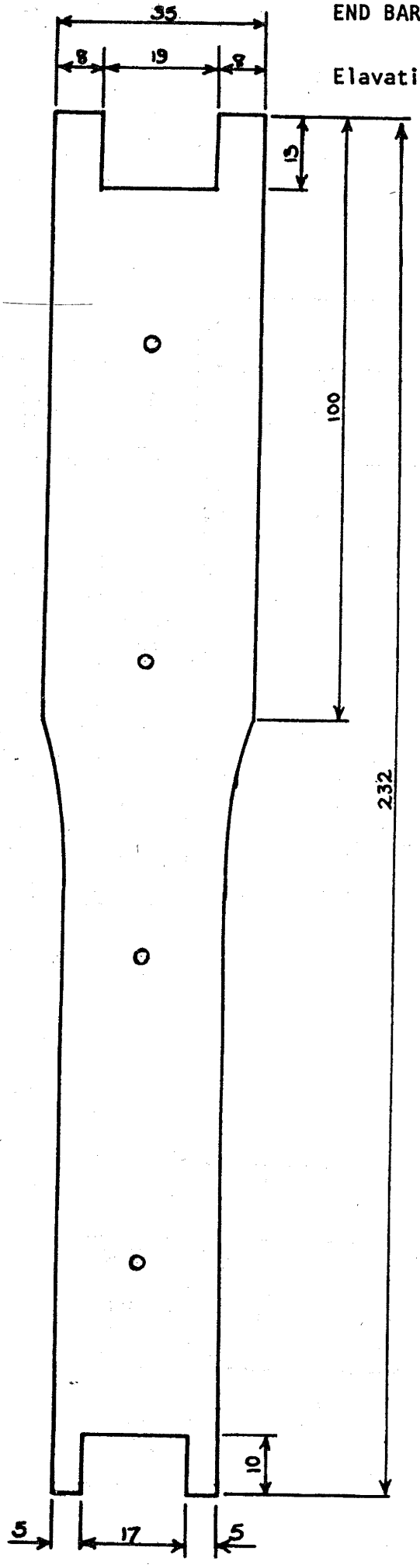
BOTTOM BAR

Plan

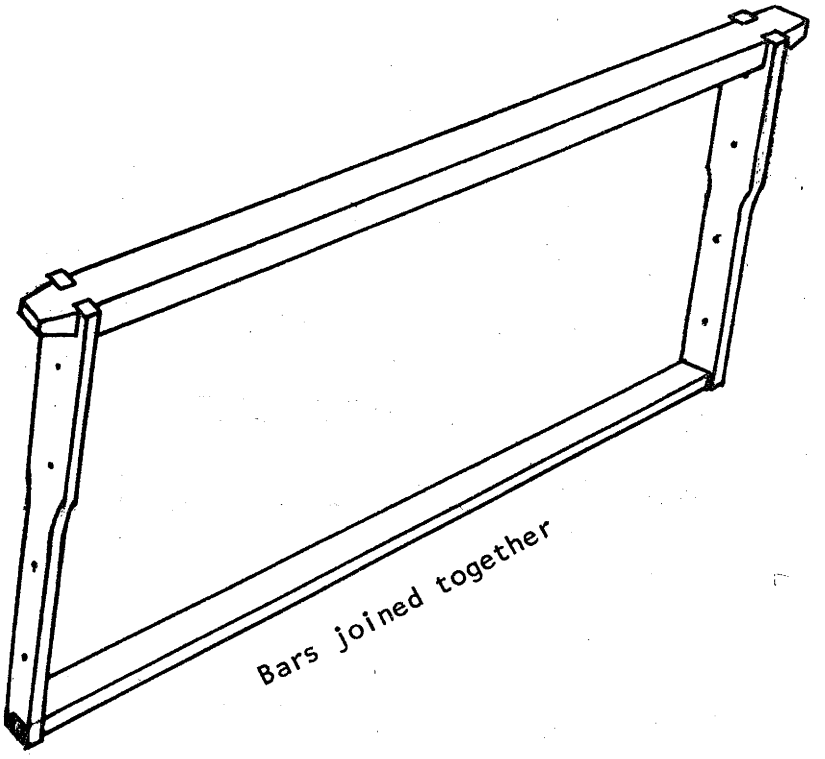


END BAR

Elavation



2 mm holes
drilled 37, 89,
140, 190 mm from
the top bar



Bars joined together

CONSTRUCTING A BEEHIVE AND ITS FRAMES

Base The supports for the base are full width. That is you need two pieces of wood 40 x 50 x 352 mm.

Box The ends are the same. Both have a hand grip and both are 22 mm timber. The ledge at the top holds the frames.

When the bases and the boxes are completed, dip them into a solution of 1% copper naphenate and mineral turpentine. This preserves the wood against the weather. DO NOT USE ANY OTHER WOOD PRESERVATIVES. Paint the outer surfaces with gloss housepaint in the usual way.

Inner lid Consists of a grooved frame holding the hardboard (masonite).

Outer lid When the lid is finished, fold a piece of flat iron over the solid wood top and nail it on to the lower rim. This provides protection against the weather.

Frames Drive two nails into the top bar to attach it to the ends of the frame. Then attach the bottom bar to the frame by driving one nail into each end.

USEFUL BOOKS

Advanced English

"The Hive and the Honey Bee". Revised edition, 1975. Edited by Dadant & Sons, Hamilton, Illinois. U.S.A.

There are many other books written in advanced English that are available in the D.P.I. library at Konedobu.

Acknowledgements

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METRIC INFORMATION

1 centimetre	= 0.39 inches	1 kilogram	= 2.2 pounds
2.54 centimetres	= 1 inch	0.45 kilograms	= 1 pound
30 centimetres	= 1 foot	1 tonne	= 1,000 kilograms
1 metre	= 3 feet 3 inches		= 2,200 pounds
0.91 metres	= 1 yard	1 litre	= 1.76 pints
1 hectare	= 10,000 square metres	0.57 litres	= 1 pint
	= 2.47 acres	4.55 litres	= 1 gallon
0.4 hectares	= 1 acre		

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