The knowledge about honeybees and production of honey in ancient India dates back to the Vedic period (about 1500-2000 B.C.). The story about the use of a hive, a home for the semi-domesticated bees, making seven combs in nature in hidden places like the hollows of the trees or underground, has been revealed by the mysterious poetic expressions of the Rig-Veda. The discovery of such a hive was made by the Ribhu(s) (three brothers working as scientists). Prior to this discovery, there are no indications of organized efforts for understanding the behavior of the bees and thus of scientific beekeeping. And the honey was collected by smoking the wild colonies of the rock bees (making a single comb: Apis dorsata Fab.) or of bees making seven combs (Apis cerana Fab.)

Indigenous hives

The use of the hollowed logs, boxes of variable dimensions and designs, and rock or wall holes as hives reflect the reminiscences of the ancient bee-knowledge, descended traditionally through generations. These ancient bee–homes are even now in use in remote villages throughout the Himalayan range of the country, extending from Kashmir to the Eastern state of Assam. Although the hive is inaccessible within and, therefore, no manipulations are possible, otherwise it is more or less compatible with the nest making behavior of the bees in the natural habitat.

Hollowed logs as hives: The logs of wood ranging from 2-3 feet (60.96-91.44 cm) in the length hollowed out and opened either at both sides or at one end, are manufactured as hives. The open end is closed with nearly same sized plank of wood fixed with mud. In the centre of the log an exit of ¾” (1.905) diameter is drilled for the movement of the bees. Such hives are placed in safe places like verandah on the roof of a house, out of the reach of domestic or wild animals, or under heavy stones for protection.

The log hive is used almost exclusively at the higher altitudes, from about 2000 meters above sea level. Perhaps an easy availability of wood at practically no cost is the chief reason for the use of hollowed log to house the bees.

Ordinary boxes as hives: All sorts of boxes with variable dimensions are in use. The back of the box is removed and replastered with mud and on the opposite side a ½” to ¾” (1.27-1.905 cm) diameter hole is made to serve as an entrance for the bees.

Wall or rock hollows as hives: The holes on the eastern wall of a house are either deliberately left while constructing the house or excavated afterwards. The holes are either rectangular or square, being 15” to 24” (38.10-60.96 cm) long and 10” to 12” (25.40-30.48 cm) deep. The wall of the recess may be having wooden planks or in some localities only a wooden roof on which the bees build their combs. The inside of the hole opens into a room of the house at a convenient height of about 5’ (152.40 cm) and it is closed by a wooden plank with a plaster of mud or a mixture of mud and cow dung. A small opening on an external wall serves as entrance for the bees.

Evolution and standardization of a modern bee-hive

There is practically no information known about the existence, utilization or management of the bees and the hives during the period between the Rig-Vedic and the late nineteenth century (1881-84) when a small hive, a prototype of the modern one, was introduced in South India by Rev. Father Newton. Nearly at the same time (1880), Mr. John Douglas introduced beekeeping in the Northern hilly tracts of the country but before the bees industry could make any impact he died. His experiences were later published in a book entitled “ A Text Book of Beekeeping in India”. Sir Louis Dane, an Assistant Commissioner at Kulu, Punjab (North India) Introduced a modern type of hive during 1882-84. Two commercial bee farms with improved beekeeping equipment were established at Raison (Kulu), North India by Mr. A Litenkov in 1932 and by Mr. N.P. Mullick in 1940. The beginning of scientific beekeeping occurred in early thirties under the leadership of Mr. R. N. Muttoo.

In East India, beekeeping was introduced in 1884 but for unexplainable reasons, it could not continue and was in fact restarted in 1913.
For over half a century, the Newton hive was used by the beekeepers especially in South India. Not consistent with the original dimensions, as many as 15 different types, all known to be the Newton hives, were found actively used in the beekeeping areas. It was about early thirties that out of hard felt necessity for modernization of beekeeping in the country, Mr. R.N. Muttoo worked through odds to fabricate a hive, suitable at least in the Kumaon hills of Uttar Pradesh, North India. The hive design by him was known to be Jeolikot Villagers' hive. This hive became gradually popular not only in the hilly regions of Kumaon but was also utilized in the plains of the Uttar Pradesh. At the Eleventh All-India Beekeepers’ Conferences, held at Nandgad, Bombay, in December 1949, and at subsequent Conferences, a suggestion for a National Standard hive was noted but no progress of real significance could occur until 1956, when an Apiary Industry Sectional Committee constituted as a part of the Indian Standards Institution met for the first time. The committee circulated a questionnaire to the beekeepers to start with. Its meetings occurring at suitable intervals over 15 years have ultimately evolved two types of hives. Such a development of the hives was essentially the outcome of two main arguments:

1. India is a vast country with multiplicity of climatic conditions ranging from zero degree temperature on high snow cold mountains through valleys and plateaux with moderate climate to extremely hot plains having maximum of 40°-45 °C temperature during summer. The variations in the climatic conditions have created distinct ecological zones which have harboured probably a variety of ecotypes of the honeybees differing in size (Venkatasubhya, 1938; Ratnam, 1939; Rahman and Singh, 1948; Kapil, 1956; Naryanan et al., 1960).

2. Some participants opined that the climatic conditions are important factors affecting the bee colony as an organic unit and its functions, therefore, these should be given due consideration, while designing the hive, but an emphasis should always be on the suitability of brood chamber capacity (BCC). It was suggested that sufficiently large brood chamber capacity will help decrease to a longway excessive swarms which are probably inherent in the Indian honeybee. The popularity gained by Langstroth hive on the American Continent from the North to the South, covering a variety of climatic conditions substantiated the contention. For these reasons, therefore, the dimensions of the brood frames and the brood chamber should particularly be considered as the basis for the new design of the hive, with provision to increase or decrease the BCC, depending upon the capacity of the bees to utilize it. The other feature that matters most is the bee space. It should be adjustable to accommodate the ecotypes found on the Indian subcontinent and it may be created through easily adjustable metal chip.

The second argument finally made the basis for the design of the hive. It was experimentally proved that compared with the small Newton hive with 759 sq in (4896.76 sq cm) BCC, the bigger hive like Jeolikot Villagers' (BCC : 1417 sq in = 9141.92 sq cm) and the Langstroth (BCC : 2742 sq in = 17690.92 sq cm) were less prone to swarming and the yield of honey also increased relatively in one locality. Each Newton hive released as many as 20 swarms and the average honey yield was around 5 kg per hive. Preliminary experiments have shown that 25% increase of BCC has given 22 – 32% higher honey yield and reduction in the number of swarms. Similar experiments carried out at two other locations in South India with 18-20 frames (BCC nearing the Langstroth hive) and 11 frame Newton hive confirmed the previous observations. Probably on account of these advantages, several commercial beekeepers in the South, North and North-Eastern beekeeping areas of the country have shifted there bees to the Langstroth hive, yet there was no uniformity in the adoption of the hive. It is likely to affect the general management of the bees, including migration of honeybee stocks from one habitat to another, the process of hybridization and extraction of honey and will require variable size bee tools. In order that rapid and sound progress of industry should occur, it was deemed essential that a hive, the core of bee industry should be standardized to make it useful for various ecological zones. Apart from a number of other frame sizes, 16'' x 8'' (40.64 x 20.32 cm) has been adopted as the standard and by the use of multipurpose division or dummy board it is possible to create from it small to big hives – similar to the Newton, Jeolikot or Langstroth and their use can be regulated depending upon the nectar flora bearing capacity of the region. The other important feature for standardization is the bee space and the sizes proposed were 3/16'' (4.76), 4/16'' (6.35) and 5/16'' (7.94 mm).

In the final analysis, three standards for the hives were proposed in 1959, accommodating 10 or 9 frames and a dummy board. More technical information collected during the succeeding decade, warranted revision of the hive standards. This led to the introduction of two types (A and B) of hives, each having a holding capacity of 10,8 or 4 brood frames and the accordingly variable bee space (7, 8 or 9 mm). Four brood frame capacity could be profitably used as a nucleus hive for starting the apiaries. The main difference between the hive types was on account of the size of the brood frames and the size proposed were – type A (230x165 cm, outside, and 210x145 cm, inside) and type B (300x195 cm, outside, and 280x175 cm, inside).

Based on these modifications, the BCC(s) finally created, are shown in table 1.
Table 1

<table>
<thead>
<tr>
<th>Type of hive</th>
<th>No. of frames</th>
<th>Bee space (mm)</th>
<th>Brood chamber capacity (sq mm)</th>
</tr>
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<tr>
<td>A 10</td>
<td>7</td>
<td></td>
<td>609000</td>
</tr>
<tr>
<td>A 8</td>
<td>8</td>
<td></td>
<td>487200</td>
</tr>
<tr>
<td>A 4</td>
<td>9</td>
<td></td>
<td>243600</td>
</tr>
<tr>
<td>B 10</td>
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<td></td>
<td>980000</td>
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<tr>
<td>B 8</td>
<td>8</td>
<td></td>
<td>784000</td>
</tr>
<tr>
<td>B 4</td>
<td>9</td>
<td></td>
<td>392000</td>
</tr>
</tbody>
</table>

These standard hives are now being introduced to the various beekeeping areas through the Khadi and Village Industries Board, with certification of the Indian Standard Institute.

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