

What would Langstroth think of insulating bee hives?

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Today's standard for bee hive construction is based on the research and designs of the inventor of the movable-comb hive, Rev. L.L. Langstroth. As a beekeeper for the past six years I have been under the impression that the hive as we build it today is as Langstroth had intended. However, I have been concerned about the lack of insulating qualities of the hive and have wondered why Langstroth, beekeeping in Massachusetts, USA, had not designed a more insulated hive.

I recently read Langstroth's book *The Hive and Honey Bee*, third edition in the form of *The Hive and Honey Bee Revisited*, an annotated update of L.L. Langstroth's beekeeping classic, by Roger Hoopingarner, Ph.D. Here are a few things I found about Langstroth's hive design and his intent in insulating the bee hive. Chapter VIII is entitled, "Requisites of a Complete Hive." He starts out by saying, "*In this chapter, I shall enumerate certain advantages which seem essential to the idea of a complete hive.*" He goes on to make 61 statements of what he considers essential in the design of a bee hive. Statement #1 refers to the need to be able to easily remove the combs. This, of course, is what his hive design is primarily known for. Statement #2 talks about being able to perform operations without hurting or killing the bees. Statement #3 says, "*It should afford suitable protection against extremes of heat and cold, sudden changes of temperature, and the injurious effects of dampness. The interior of a hive should be dry in winter, and free in summer from a pent and almost suffocating heat.*" The word "pent," according to the dictionary, means "shut in or confined." Later in the chapter in Statement #48 he says, "*It should enable the beekeeper entirely to dispense with sheds and costly apiaries; as the hive itself should alike defy heat and cold, rain or snow.*¹⁶" Back in Langstroth's time in the mid 1800's, sheds and apiaries were commonly used to provide the bees and the beekeeper an extra layer of protection from the outdoor environment. Today, in most cases, we have done away with the buildings that provided additional insulation from the elements. Footnote #16 by Mr. Hoopingarner says, "*Many beekeepers that used straw skeps had a covering over the hives. The Langstroth original hive was also double walled so it would have been better in the winter than our current models.*" Langstroth's double wall construction would provide an insulating affect for the hive in the same way that today's double pane windows provide better insulation for our homes than old single pane windows.

In another of Langstroth's books called *Langstroth on the Hive and the Honey-Bee, A Bee Keeper's Manual*, by L.L. Langstroth I found the following in Chapter VIII, entitled "Protection against Extremes of Heat, Cold, and Dampness": "*From these remarks, it will be obvious to the intelligent cultivator, that protection against extremes of heat and cold, is a point of the VERY, FIRST IMPORTANCE; and yet this is the very point, which, in proportion to its importance, has been most overlooked. We have discarded, and very wisely, the straw hives of our ancestors; but such hives, with all their faults, were comparatively warm in Winter, and cool in Summer. We have undertaken to keep bees, where the cold of Winter, and the heat of Summer are alike intense; and where sudden and severe changes are often fatal to the brood: and yet we blindly persist in expecting success under circumstances in which any marked success is well nigh impossible.*"

Langstroth refers to *"...the folly of pretending to keep bees, in the miserably thin and unprotected hives to which we have been accustomed."* He goes on to say, *"We are now prepared to discuss the question of protection in its relations to the construction of hives. We have seen how it is furnished to the bees in the Polish hives, and in the decayed hollows of trees. If the Apiarian chooses, he can imitate this plan by constructing his hives of very thick plank: but such hives would be clumsy, and with us, expensive. Or he may much more effectually reach the same end, by making his hives double, so as to enclose an air space all around, which in Winter may be filled with charcoal, plaster of Paris, straw, or any good non-conductor, to enable the bees to preserve with the least waste, their animal heat."* He states: *"...the same construction which secures them against the cold of Winter, equally protecting them from the heat of Summer."* He goes on, *"I have been thus particular on the subject of protection in order to convince every beekeeper who exercises common sense that thin hives ought to be given up if either pleasure or profit is sought from his bees. Such hives an enlightened apiarian could not be persuaded to purchase, and he would consider them too expensive in their waste of honey and bees to be worth accepting, even as a gift. Many strong colonies which are lodged in badly protected hives often consume in extra food, in a single hard winter, more than enough to pay the difference between the first cost of a good hive over a bad one. In the severe winter of 1851-2, many cultivators lost nearly all their stocks, and a large part of those which survived were too much weakened to be able to swarm. And yet these same miserable hives, after accomplishing the work of destruction on one generation of bees are reserved to perform the same office for another. And this some call economy!"*

It appears that Langstroth was so smart that he predicted that beekeepers would accept the additional protection provided by his movable comb design but not necessarily the protection provided by his double walled feature. He says, *"I am well aware of the question which many of my readers have for some time been ready to ask me. Can you make one of your well-protected hives as cheaply as we construct our common hives? I would remind such questioners that it is hardly possible to build a well-protected house as cheaply as a barn. . . . If they are not built of doubled materials they can be made for as little money as any other patent hive, and yet afford much greater protection, as the combs touch neither the top, bottom, nor sides of the hive. I recommend, however, a construction which, although somewhat more costly at first, is yet much cheaper in the end. Such is the passion of the American people for cheapness in the first cost of an article, even at the evident expense of dearness in the end, that many, I doubt not, will continue to lodge their bees in thin hives in spite of their conviction of the folly of doing, . . ."*

I have to ask myself, why have we for 160 years ignored Langstroth's research and teachings on the subject of winter protection? Langstroth was well aware of the bees' clustering in winter and the need for ventilation, and he took that into consideration in the design of his double walled hive. There is no new research which supports abandoning Langstroth's belief that the bees should be provided with protection from extremes of cold and heat. Perhaps, as Langstroth predicted, the cause was the additional cost of constructing double wall hives. Perhaps the additional time involved in operating and maintaining them caused the beekeeping industry to ignore the double wall insulating feature of Langstroth's design. Though a better hive could be manufactured in keeping with Langstroth's original design, there may have been a decision made by businesses that the single wall hive would produce a

greater profit due to its lower construction cost, lower sale price and therefore larger sales appeal and gross sales. Perhaps the commercial beekeepers saw in the single wall hive a design which could be operated and maintained more quickly and with fewer complications than a hive with additional components. For commercial beekeepers the additional expense of a better hive may not have been so much an issue as the cost of labor to take care of the bees and the hives in a double wall design. In addition I think most commercial beekeepers generally do not keep their bees in colder climates during the winter anyway.

In doing my research for this article I have gained a great respect for Rev. Langstroth, not only as a beekeeper, researcher and inventor, but, also as someone who understood the way people think and act. He seemed to know which of his recommendations people would readily accept and which they might abandon. Here we are today, using only the parts of his design which were adopted for use by the industry over a century ago. It's time we revisit Langstroth's work and take advantage of all he learned in his research. If Langstroth had access to today's modern construction materials, he certainly would have been able to have insulating features of his hive adopted as standard construction. Today a \$150 hive with a \$100 package of bees can be permanently insulated in excess of Langstroth's double walled design, with materials costing as little as \$20 and without affecting the design of the internal components or the normal routine for managing the hive.

If you believe, as I do, that Langstroth intended to provide bees with a hive in which they could better protect their colony from extremes of heat and cold, you will now have to ask yourself if you can provide such an environment for your bees. Keep in mind that today we can fulfill Langstroth's intent without the complexities involved in executing the construction and maintenance of a hive matching exactly his drawings. We can insulate our hives with materials which will hold up well over time and not interfere with the operation or maintenance of the hives. If you would like some ideas of how this can economically be accomplished, you can check out the system we use at Stewart Farm that is posted on our website at <http://bees.stewartfarm.org>. If you have a different system, we would love to hear from you. You can email us at xharpspah@aol.com. We publish a free email newsletter on hive insulation; if you would like to be on the mailing list just drop us a note.

Two things we have come to believe in while researching the issue of hive insulation are, 1) Old research can be very valuable, and 2) Hobby beekeeping needs differ enough from those of the commercial beekeepers that we need to be very careful of accepting the way things are done in big business as the way we should be doing things in our own backyards.