

honey-sac is full  
is also evi-  
number of  
n the adult  
oney to the  
ns are more  
amount of  
ged to wax.

bees, and  
ney, supply-  
If of empty  
never seen  
t when the  
was no more  
and no full  
wo instances  
sted, but in  
was room to  
d by a sud-  
, and I as-  
the inability  
, warmth of  
becoming too  
d had to be  
s are so rare  
notice.

begins, and  
combs for the  
here is very  
at which is  
lengthen the  
down during  
le consuming  
our apiarists  
re cut away  
is used. So  
and "whiten"  
own to both  
producers at  
Should we  
combs as a  
placed where  
s sufficient to  
whether they  
elsewhere or  
honey in the  
ly well filled  
on.  
as build brace-  
paces (in their

judgment, evidently) or waste wax other-  
wise by plastering it on the walls, as  
they had plenty of empty combs within  
their reach.

It appears to me that we can very  
easily reason the bees' action in comb-  
building. When the crop is light their  
stomachs are never crowded. Only for  
a few minutes at each load does a bee  
find opportunity or desire to pass into  
the digestive organs more honey than is  
absolutely necessary for its sustenance.  
When it reaches the hive, and hands  
over its load to a young bee, the latter  
easily finds a storing place for it. Then  
there is no inducement for either of them  
to build comb or to consume honey in  
comb-building. But when the crop is  
well on, or sudden; when each adult  
worker brings home a full load and at  
once goes back for more, with all the  
eagerness of a miner who has found a  
fortune, then all the combs are soon  
filled. If the apiarist has not provided  
an extra supply, the young bees, after  
filling all the cells, have to retain in  
their honey-sacs as much as they can  
possibly contain, since the harvest keeps  
arriving from the field. Then it is that  
wax-production is not only welcome, but  
involuntary, for there is no other way  
of overcoming the difficulty.

Every apiarist who has opened a crowd-  
ed hive at the time of a sudden and  
plentiful harvest has noticed how full  
all the bees look, how sluggish they ap-  
pear, hanging to each other in festoons,  
apparently idle, waiting for their honey  
to change into wax so that they may  
build more combs. Should there be no  
room for more combs, the wax would  
have to be wasted unless the bees swarm-  
ed. This waste will not take place as  
long as there is a single cell to finish, a  
corner to fill, a cell to seal. Open a hive  
in this condition and supply it at once  
with empty combs and the conditions  
will change. You will immediately see a  
new activity. They deposit their honey  
and rush to the fields again. Those that

have produced wax scales utilize them to  
repair the combs given them, as well as  
to strengthen these combs.

The evidence of the great cost of combs  
to bees is visible, it seems to me, in the  
economy with which they build these  
combs. How light and fragile they are!  
If wax cost them next to nothing, they  
would surely build them stronger at first.  
But it is only when they handle over  
old combs that wax is added to them to  
make them strong—they add a little here  
and there. Is that wasted wax? Not  
by any means. If you are a producer  
of extracted honey, you know how much  
nicer it is to handle a comb which is  
several years old, for it is much tougher  
and less liable to break than the new  
combs just built.

In my experience, I have found no  
more waste of wax in the production of  
extracted honey than in that of comb  
honey. As long as your bees have room  
there will be no waste of material, but  
whenever the combs are full and sealed,  
and every space crammed, there is a  
chance for waste of both honey and wax,  
whether you are producing comb or ex-  
tracted honey.

That the bees must produce more or  
less wax during a harvest does not ad-  
mit of a doubt, but that they must pro-  
duce enough wax to store all the honey  
they harvest, and that the supplying of  
combs already built is a waste, I cannot  
admit. Far from that, I hold that in  
locations where the harvest is sudden  
and very large for only a few days, there  
is a positive loss in compelling them to  
build their combs before they store their  
honey. In countries where the flow is  
gradual, beginning with a few ounces  
per day, increasing steadily to a few  
pounds, the loss from lack of combs is  
smaller. But when the honey flow is  
delayed by unfavorable atmospheric con-  
ditions until the blossoms are in profu-  
sion and the harvest begins with a rush,  
there are days when the bees are actually  
compelled almost entirely to suspend op-