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be noted that in only 11 per cent. 10, while No. 13 No. 10 only two, was more nearly com than No. 10. be learned from and comparisons, mation of the old othing invariably.

Journal.

G PROBLEM.

he Need of More Which to Base ons.

. MILLER

" Bee Culture) intering in Gleans interesting, parillustration of the ib'' method of prevalent among he precise methods t so long as dem the faulty, ime observations as so long will the on fail to bring results.

> f the factors not vill serve to illusof the data. One kness of packing other, the nature ether it is thick virtually air-tight or is not covered er; the color, etc. r other of these, tight covers are hions, and whetsage over tops of 10t. A few other d, such as frames ance; size of the

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latter; direction it faces; direction of prevailing winds; any gales or unusual atmospheric conditions; size of colonies (average variable in different years); queens old or young; breeding stop early or late; pollen stores, large or small; nature of stores and abundance; whether bees were overhauled, and frames changed at all after final stores were gathered or supplied; whether the location is subject to thaws or fogs, or on the contrary; whether snow on ground was above or below normal most of the winter.

Everyone of the foregoing has its bearing on the results; and how few of even the more important ones have been mentioned by the writers. One person attributes his success chiefly to one factor, while the next man lays emphasis on quite a different one; yet as a matter of fact the favorable results are quite as likely to be in *spite* of either item which these men deem so important.

In taking temperature of the interior of the hive, the methods recorded are most imperfect. Putting a thermometer on top of frames over the cluster gives only one item-namely, the temperature near the upper side of the cluster; and how near the writers fail to state. Was the cluster close to the top of the frames or even up over them? Or were the bees one, two, or three inches below the inchthick top bars? Was the cushion laid on the thermometer and frames or was there an air-space? Was the thermometer read through a plane of glass or was it taken out? There is one accurate way to get hive temperatures, and that is to use special thermometers with long stems, placing enough of them in the hive so the temperature of the air near the floor, halfway up and at the top, both near and distant from the cluster. may be secured. Also, the temperature of cluster and air directly above it should be obtained. In addition, if chaff or other packing is used, temperature

of this over the top of the cluster, and distant from it, is desirable.

The special thermometers are made so the scale to be read is above the hive, and readings can be made without removing the thermometer or disturbing the bees. The readings should be made hourly, both night and day, at least in the fall and spring, while in the really cold weather six times in the twentyfour hours may do.

The "curves" plotted from these readings in hives differently protected can be compared with "curves" from similar data taken in unprotected hives; and with the outdoor temperature a real basis of work will be reached.

Mr. Britton cites his results with glass-topped hives from which he removed the top packing and later substituted black tarred paper. The disastrous results could have been foretold without need of demonstrating. Moisture was bound to collect on the cold glass, and drop back on the bees. With an entrance as small as stated, and with eight to twelve inches of packing around the hives, no other result could be secured. The black paper could afford no material relief under such circumstances. His citation of results of colonies in his attic serves to call attention to the fact that bees so placed have their hives surrounded by a temperature of about 50 degrees F. all winter.

As examples of how bees thrive under conditions as opposite as possible to the warm-packing theories, the following may be cited. These I have perhaps referred to before, but they are well worth repeating. In the western part of New York two colonies were left to their own devices after having set, early in the season, inside of large cupboardlike structures which served only to shut off the sun. Four or five entrances about three by twelve inches gave ample circulation of air through the The floor of these was cupboards. 18 inches above ground. The bees were



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