

susceptible to cold that if they are unable to keep the hive heat above 57° Fahr. they perish.

While not agreeing that bees cannot stand a temperature of 55°, or even much less, this principle holds good: if we can maintain as even a temperature as possible, varying from 60° to 70° Fahr., we fulfil one of the essential conditions of successful hibernation. If we can do this our bees are kept in a serene, semi-dormant state; and whilst in this condition there is naturally a much reduced consumption of food, and the resultant objections of an undue injurious quantity of moist hot air charged with carbonic acid gas, this moisture is frequently freezing on the combs, and the carbon di-oxide sinking upon cooling; to be raised again during the next excitement in poisonous death-dealing doses. In the pamphlet on "Wintering Bees," which should be carefully perused by all bee-keepers interested in this question, we are told the normal heat one should endeavor to steadily maintain is 65° to 70° Fahr.

Pure air, as we know it, cannot be supplied conveniently to bee-hives without subjecting the inmates to the variations of our notoriously changeable climate, thus producing the very evils we wish to avoid—extra consumption of food, with its train of dire consequences. We may, though, provide an empty chamber below the clustered bees, which will have a tendency to keep the air in the hive more equable as regards foul fumes and temperature than without such a space, and we are pleased to notice that hive makers recognized this point in exhibits at the recent Royal Show, a shallow frame or section lift being made in such a manner that part of it may be used in winter as a ventilating rim under the brood-nest. Moisture and foul air there must be in some proportion, and the less we have of these the more we minimise the risk of loss. *Perrious* quilts and narrowed entrances are preferred by some, the moisture and warm carbonic acid being absorbed by and passing through the non-conductive covering. On the other hand, successful wintering is accomplished by using impervious American cloth, kamptulicon, kineolium, oil-cloth roofing (not boiler), felt, etc., these being covered by warm clothing which holds the heat and keeps the tops of the frames at a pretty uniform temperature, but in this case the widest possible entrances are given.

At all risks, currents of either cold or warm air passing through the hives are to be strongly deprecated, whilst any plan which assists in removing moisture and impure air in the slowest, steadiest, most uniform fashion, should find acceptance. So shall we be best assisting our

bees to spend nature's long sleeping period in that drowsy, sluggish state, midway between absolute death and active life, in which they best work out their annual sentence of 'three months' imprisonment without hard labor,' with the prisoners' usual amount of exercise, with just sufficient food, enough blanket, moderate ventilation, little light, whilst work is reduced to a mere name, cell-cleaning being almost as much as is required. The spring soon shines again, and when the prison doors of winter fly open, the flowers, too, are free to commence another cycle of work, all nature shakes off the shackles of hibernation, vernal vigor surrounds her, the erstwhile torpid worker-bee joins in the chorus and prospers the art, unwittingly, of the glad bee-master. B. B. Journal.

#### Plenty of Bees, Food and Packing; and Several Other Things Essential to success in Wintering.

*Continued from last week*

**I**S it is only by comparison of opinions, that truth can be reached, I will now criticize some of the points in your editorial. You start out with the idea that bees can be well wintered only when they can have frequent flights. While flights are probably an advantage, I years ago came to the conclusion that they were far from being as valuable as generally supposed. About fifteen years ago I made some quite extensive experiments in flying bees under glass, covering dozens of colonies during three winters, and finally abandoning the plan as not being worth the trouble. Such flights were, I thought, a preventive of disease, but not a cure after it was once started. The real reason bees winter better when they have several flights during the winter, is not, I think, so much on account of the flights themselves, as because such winters have a much less amount of severe cold weather, and the cold does not succeed in penetrating so far into the packing. If I am right, and my experience in Iowa sustains this view, then all that is necessary to enable bees to pass severe winters as well, or nearly as well, as mild ones, is to pack them with more or better material, and in a more thorough manner. Northern Iowa is in about the same latitude as your own home, but it is colder on account of the more open prairie country, and the lack of the protecting circle of great lakes which nearly surround Michigan.

I have never failed of wintering my bees in excellent condition except when I failed in giving them one or more of the "requisite conditions" already mentioned; especially Nos. 2 and 3. In that severe winter of '80-'81, which so