

are doing almost that now.

There is the recorded case of a colony producing one thousand pounds of honey in one year; of course this was in a good season, and under careful manipulation, but think what a valuable queen was lost when that queen was not made the mother of a long line of breeders to be distributed all over the United States. Few honey producers are so situated that each colony can produce any such amount of honey but it is necessary to aim high.

There are two points which require additional consideration. The first is the desirability of breeding the race pure. Crosses or hybrids are so variable that they should be avoided except when necessary. Let me quote from Dr. W. E. Castle, of Harvard University, on this point:

"Since cross breeding is likely to modify characters even when these conform to the laws of alternative inheritance, and is certain to modify them when they give blended inheritance, it should be practised with extreme caution, and only by the breeder who has a definite end in view and a fairly clear idea of how he is going to obtain it.

"The purity of standard breeds should be carefully guarded, and much attention should be given pedigrees, for even when individual excellence is not apparent, it may be present in recessive or else in a latent state, which suitable matings will bring into full realization, provided the ancestors were superior animals.

"At the same time the breeder should on the lookout for individual peculiarities of merit. And he should not be discouraged if these are not transmitted to the immediate offspring. A simple character which disappears in the children, but re-appears among the grandchildren, can at once be made a racial character, for it is

recessive in heredity."

The breeder who uses a mixture of races for breeding is doing something which is very likely to cause him trouble. There is very little necessity under present conditions for this, since a good race may be chosen as a foundation stock which can be surpassed by crossing only with difficulty, and careful and systematic selection within the race will bring almost as good results with the great advantage of more stability, a point of vital consideration. Let me make this point a little clearer. There is reason to believe that where some queen-breeder takes up the improvement of bees by crossing he will outstrip all the rest. He will induce greater variability, and will, consequently, have a greater range of material for selection; he will be enabled to combine the desirable traits of two or more races, and, at the same time, if proper care is used, eliminate the undesirable traits. This can be done purposely only by a person who has a most thorough understanding of heredity and variation, and no one else should undertake it, for there is otherwise too great a danger of bringing out all the undesirable traits and losing the good ones. This, then, is why pure races are generally so essential; when the proper men take hold of crosses they will get great results, but the majority of breeders should not risk the handling of fire in that way, and as for the rank and file of bee-keepers, it is, I think, absolutely folly. A bee-keeper may say that he cares nothing for races; that all he wants is honey. All this is very true, but he cannot afford to overlook the fact that nature has laws which he, with all his independence, dares not disregard. I consider the bee-keeper who fills his apiary with what we may call scrub hybrid stock is a poor bee-keeper.

The second point is the common pre-