

distribution of colonies in comparison of honey production importance of honey and the European production.

by the author Ed. de Brignan, Montpelier 2, France 50 cent.

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Apicole states the treatment of rheumatism is becoming more important in Europe.

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du Hainaut et al. has entered a campaign of adulterated honey upon the market. One-fourth of a kilogram was taken by members of the secretariat for examination.

College, Amherst,

REVIEW

"Improvement"

we remember aright, we need any effort to "improve" the races of bees as the downright wicked. We are misled, but at the same time we know that the honey bee has an open mind ready to receive. The place of honor in the Review is given to the correspondence that has been the subject between several "students of apiculture" and the evolution, heredity

maintained in a previous issue. Dr. Phillips had explained that it was possible to fix a character by breeding, and in substance to the several men mentioned writes as follows:

"I have always been of the opinion that the bee is the most highly specialized animal alive, and that all progress, change or improvement ceased ages ago. If I am wrong in this, I wish to try to develop a strain or breed of bees which will be good honey gatherers, reasonably gentle, and hardy in this climate, but so long as it is not convenient to control male parentage, though in the Dakotas, where I lately spent some time, there are millions of acres which never saw a bee, treeless, flowerless plains where mating can be controlled perfectly, I think), and a generation of worker bees is but forty (40) days, of a queen three or four years and a drone two or three months how may we begin? We bee keepers have been importing Italian queens for half a century, and so far as I can see we still have nothing but Italian bees, and so far as I can see cannot point to a single advantage gained, notwithstanding the claims set up by some writers. I am not criticizing belief, which proves nothing, but unsubstantiated claims. I want to know more for the bee keeping world than myself.

Is any improvement in the bee to be looked for, even if we can control the mating?

Is the bee biologically the dandelion of the insect world, a perfect type?

To Dr. Bonney's questions Professor W. M. Wheeler replied as follows:

Replying to your interesting letter of the 11th inst., I would say that my little experience with the honey bee leads me to believe that there is no inherent reason why it should not be capable of considerable modification through experimental breeding. I believe, however, that much headway cannot be made until it is possible accurately to control the mating of the queens and drones. Of course, if there are great stretches of country in which bees are lacking, it would be possible to obtain satisfactory results in the open. * * * Of course the honey bee is an extremely highly specialized insect, but not more so than many of the solitary bees, and that vast number of species of the latter (probably some 5000 in the United States alone!) often very closely related to one another, shows that the group is still very plastic and probably undergoing active speciation. This is my main reason for believing that the honey bee is not a form which has reached the end of its

development, but that it may have a future before it. It is, of course, not impossible that someone may invent a method of artificially impregnating the queens of honey bees. So many very delicate operations have been performed on insects lately that we may look forward to something of this kind. In that event it would undoubtedly be possible to make very considerable modifications in the races of honey bees.

I do not know whether these points are of any interest to you but if I have not made myself perfectly clear I should be glad to write you further.

Yours very sincerely,

W. M. WHEELER.

Professor Newall, of College Station, Texas, to whom a similar letter had been sent gave the following reply:

Dear Sir,—I feel honored by the receipt of your letter of the 5th instant, and the first thing I must do in replying is to express regret that I cannot give you the information you desire.

I have been interested in bees all my life, but as to investigation of inheritance in the honey bee I have done nothing, so far, other than to study the problem and to plan a few experiments.

During this summer I spent two months at the Bussey Institution, Forest Hills, Massachusetts, studying under Prof. Wheeler, and under Dr. W. E. Castle, professor of genetics and experimental evolution. The information that I gained there relative to the methods of breeding led me to believe that it is possible to find out what characters in the honey bee are transmitted according to the Mendelian scheme. I will have to determine, first of all, what characters of the honey bee are really Mendelian and will thereafter have to find out by experiments just how these characters act in inheritance. Genetics, as you are doubtless already aware, is a science which has developed within the last ten years, and it is nothing more or less than the elaboration of the Mendelian law.

So far as I know, there has been practically no application of genetics in the case of the honey bee, but the numerous instances in the case of other animals and insects in which characters are transmitted according to a definite mathematical plan, and the manner in which mutations can be fixed and made permanent characters leads me to believe that similar work can be done with the honey