cerning the absolute inefficiency of the "flash" method. The harm it may do by giving the people a sense of false security is also self-evident. In the remaining epidemics the milk was consumed raw. It would seem that our only safeguard against such epidemics is efficient pasteurization not only of the milk and cream, but also of the material entering into the manufacture of other milk products. It is a point of some importance that it is not uncommon for firms to sell pasteurized milk, but to sell cream in the raw state. The latter of course may be even more dangerous than milk.

The question as to what constitutes efficient pasteurization for streptococci is one that evidently requires further study. It is commonly stated in the literature that pathogenic streptococci are killed at relatively low temperatures (52°–54° C. for 10 minutes Sternberg). Undoubtedly for many strains this is altogether too low. The recent work of Ayers and Johnson[9] indicates that the thermal death point of typical streptococci varies considerably and one of 22 strains studied by them resisted heating for 30 minutes at 62.8° C. (145° F.), the usual temperature for pasteurizing. Furthermore, their viability in milk and milk products should be carefully studied since we know the media may exert an important effect on the resistance of organisms to heat. The pasteurization process may therefore have to be modified accordingly to meet these demands.

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The Artificial Fertilization of Queen Bees

In July last, the senior writer called the attention of the junior writer to the desirability of attempting some work in bee culture, with the object of securing pure-bred queens. One of the lines of work decided upon was that of artificial fertilization of queens. In spite of the lateness of the season, it seemed advisable to begin work at once and eight newly emerged queens were secured before the end of the queen-producing season.

In six of the experiments, we suffered failures from natural causes; robber bees killed three and the workers refused to accept three. In a seventh case, the queen died as a result of an infection probably set up at the time of fertilization.

In an eighth experiment, apparent success seems to have followed artificial fertilization, and whatever the nature of this may be, it seems of sufficient interest to be recorded, awaiting, in the meantime, the next season for further attemps at confirmation. This queen emerged from her cell on July 23, 1914. Both wings were so rudimentary as to be almost unnoticeable. She was kept in a 3-frame nucleus, in which no drones were present and with a queen excluder applied to the entrance. On July 28, the seminal vesicles and spermatophore of a drone, which was captured in flight near one of the hives, were dissected out, teased apart, and contents diluted to facilitate manipulation. The fluid containing spermatozoa was then carefully injected through the genital opening of the queen. After this was done she was replaced in a queenless and droneless nucleus with queen-excluder applied to the hive.

By August 4, the ovaries showed considerable development, as indicated by the size of the abdomen, and on August 18 she began to deposit eggs, continuing to do so up to the time of writing, although normal queens had ceased to lay eggs for about a month. This was due probably to the stimulation given this swarm by feeding. To date, at least 3,000 eggs have been laid. The remarkable thing is that all the eggs have produced worker bees except four, which produced drones. In every respect the brood, capping of the cells, and the resulting worker bees are perfectly normal.

At present, the swarm is being strengthened and prepared for winter, so that studies of this remarkable queen may be continued next season.

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[9] *Jour. of Agricultural Research*, 1914, 2, p. 321.