Mr. Mann thought the division into families a decided advantage, not only from the systematic standpoint, but also from the bibliographical point of view. It much facilitated reference making and indexing and the groups could in all respects be dealt with more satisfactorily.

The following paper was then read by its author :—

LONGEVITY AND VITALITY OF ARGAS AND TROMBIDIUM.

BY MARY E. MURTFELDT.

It seems incredible that creatures as highly organized as the ticks and mites should be able to live for months and even years without food, and, in the case of some of the former, are capable of surviving even a prolonged immersion in a somewhat acrid fluid.

As an illustration of this remarkable vitality I wish to call attention to the case of two species that have come under my observation during the past year.

About the middle of April last I received from a correspondent a specimen, probably about two-thirds grown, of a species of cattle tick, determined for me by Dr. Riley as *Argas reflexus*, and supposed by him to be found only, or usually, on pigeons.

This creature had been inclosed loosely in the folds of the letter of inquiry, and the pressure in the mail bags, or perhaps the postmaster's stamp had completely expressed its sanguinary contents which were smeared over the paper. The tick, however, though almost as flat as a sheet of paper, was very much alive, and, with the intention of making some experiments upon it, it was placed in a small bottle from which alcohol had been hastily rinsed, but which was not thoroughly dried.

Here it was suffered to remain for a week or ten days without further attention. At the end of this time, happening to think of it, I found it immersed in the moisture which had collected in the tightly closed bottle, which, by the combination of the water and alcohol, had become a fairly strong vinegar. To my surprise upon shaking the tick out upon a blotter I found it apparently none the worse for its acid bath. With a view to test its powers of endurance still further it was then placed in a small, tight tin box in which was a layer of dry sand and a bit of oak leaf.

Under these conditions it still survives. A fresh bit of vegetation is occasionally introduced into the box, but there is no evidence that the

Argas makes any use of these leaves ; it neither increases nor diminishes in size, nor has it, as yet, moulted, although under such conditions the latter was to have been expected. Very similar to the above was the case of a specimen of the large and beautiful scarlet *Trombidium sericeum*—an egg parasite of *Caloptenus spretus*. A number of these mites were sent to me by a lady who had received them from Texas. They were put into a glass jar upon an admixture of sand and garden soil. Some young locusts were also placed in the jar as food, since I was not able to obtain egg pods of the latter. None of the mites, however, seemed to feed, and in the course of a month or six weeks all the smaller specimens had perished. One, however, that was considerably larger than the others, was found to have buried itself in the earth, and when turned out seemed to be perfectly healthy and not in the least shrunken. Upon being restored to the jar it at once burrowed into the earth, tunneling to the bottom.

In this way, hidden from sight, except as I turned it out about once a month, it survived, without food, until the following December, when, the temperature having fallen quite low in the room in which it was kept, it succumbed to cold and perished.

It was stated that Dr. Riley had kept a specimen of this tick alive without food for seven years, and that during that time it had repeatedly moulted.

Mr. Mann stated that he had kept a bombycid larva without food for ten weeks. It did not moult during that period.

Dr. Marx stated that *Argas* breeds also on cats and dogs as well as cattle, and is not confined to pigeons. He showed by blackboard sketches how, when some of the ticks are full fed, the family characters become obscured. Where the head is normally retracted under and concealed by the dorsal surface, when gorged with blood, this character disappears, and it is hard to distinguish them from the *Ixodidae*.

Mr. Smith stated that he then had a *Trogoderma* larva alive in a vial closed with a rubber stopple, in which it had lived without food for more than a year. At irregular intervals it moults, but does not seem to change much otherwise, and does not eat the cast skins.

The following paper was read by the Secretary :—