

both extractors and who preferred the sun extractor to raise their hands. The showing of hazards was numerous and the preponderance of opinion was held to be in favor of the sun extractor.

Mr. Lang—I might say in my process I put the refuse on the fire and it would not burn, so that there was not much wax in it.

On motion the Convention adjourned to meet again on Thursday morning at nine o'clock.

Thursday morning, December 11th, 1896, nine o'clock.

President Darling in the chair called the meeting to order.

Past President Holtermann introduced Prof. Harrison of the Ontario Agricultural College, whom, he stated, had made certain experiments with reference to the killing of the germs of disease in connection with honey.

The President elect welcomed Prof. Harrison, and assured him that the Association were pleased to have him present and would be glad to hear from him.

Prof. Harrison on rising to speak was greeted with applause.

#### PROFESSOR HARRISON.

Mr. Chairman and Gentlemen,—These investigations which I have been carrying out since June of the present year, were undertaken at the suggestion of Mr. Holtermann. Mr. Holtermann gave me a pamphlet which most of you probably have read or heard of, by William R. Howard of Texas; in this pamphlet he sets forth certain propositions, and it is to these propositions I will refer. Mr. Holtermann has supplied me with all the material, with the exception of some which I have written for myself in other countries. The propositions which were marked especially were towards the end of this pamphlet; I will briefly read what these were, and also state the work which has been done, in order to bear out my different conclusions, or confirm them or otherwise. The proposition (No. 3) upon which most stress was laid reads as follows: "That the vitality of the spores of bacillus alvei is destroyed when exposed to atmospheric air for from 24 to 36 hours." Howard, in making these experiments, took the dry scale which some of you are probably familiar with, from the foul brood hive and ground it up with sterilized road dust; this was thoroughly mixed up and dried and exposed to the air for different lengths of time. I may here remark that in Howard's conclusions he does not say whether he exposed it to sunlight or

whether to the ordinary light of a room, or what kind of light. This is of considerable importance in all bacteriological work because it is a well known fact that the sunlight is a very good germicide, and when germs are exposed to the sunlight will either kill or injure them to such an extent that their growth is retarded. He does not mention that in his report. Also you will notice, he tried the dry scale mass from the hive. In the experiments which I have conducted I did not exactly follow according to his line; to begin with I did not use the scale mass from the hive; the first of all isolated by bacteriological methods the bacillus which causes this disease; having found that, I grew it in quantity in a pure culture. I used, to begin on, the pure culture that has this germ at that alone. If you take the scale as a rule you will find several kinds of germs which I have succeeded in isolating myself, in addition to the foul brood germ.

This pure culture was taken containing nothing but the bacillus and was spread on thin pieces of glass, what is known as cover glass, which has been previously sterilized—when I use that word I mean that all life as far as germs is concerned is eliminated from the article in question. These small pieces of the glass were moistened with a drop of sterilized water placed upon them and the foul brood bacillus, after being filtered through glass wool, sterilized in order to grind up the different matters, was spread by means of a sterilizing needle on top of this glass, it was then dried in the sun. These cover glasses, of which I had a large number, were first of all placed in a chamber simulating the appearance of a hive, that is, partial darkness, and so arranged that there should be a draught of air, the temperature varying at different times from 65 to 90. These were exposed for different lengths of time. After a certain lapse of time, in fact, every 24 hours I took out these glasses out and tried to see whether they would grow again on media which bacteriologists use for that purpose. I may here say that this chamber was moistened with a very weak solution of formalin, about one half per cent solution. In connection with that I have found that the growth of the germ occurs, exposed to the darkened atmosphere, up to one month; it will go on longer than that, but I have not tried it for any longer. As you see, Prof. Howard says he finds no growth after thirty-six hours. From my experiments I have found growth up to one month; I have not the slightest doubt but that the growth would go on continuing if the experiment were proceeded with. I was a little doubtful about the result the first