

2 hours .....	115°O	.....growth.
2 " 15 minutes ...	116 "	....."
2 " 30 " ..	115 "	.....no growth.
2 " 45 " ..	115 "	....."

### 3. Capillary tubes with spores in distilled water.

30 minutes.....	114°O.	..... growth.
1 hour .....	114 "	..... "
1 " 30 minutes....	114 "	..... "
2 hours .....	114 "	..... "
2 " 15 minutes ...	115 "	..... "
2 " 30 " ..	115 "	..... "
2 " 45 " ..	115 "	.....no growth.

The temperatures were taken in a large vessel containing 10 pounds of boiling honey. The experiment was repeated, using buckwheat honey instead of clover and with like results.

*Relation to Light.* A few experiments were made to ascertain the behaviour of spores toward light. Coverglasses spread with spores and dried, were exposed to bright sunlight during the month of February. The exposure was in the open air and the glasses were on black tile. The temperature varied from—12° C. to—22° O After exposure, the glasses were placed film side downwards on agar plates, and then incubated at 37° C.

#### Time.

*Results*—3 hours sunlight.

6 " "  
9 " "

#### Result.

Abundant growth in 16 hours

" " "  
" " "

These experiments were repeated in September, when the outside temperature varied from 24° to 30° O., with the result, that there was growth after 4, 6, and 7 hours' exposure.

Agar plates exposed after inoculation showed great differences. For instances, spores 21 days old was killed by 5 hours' exposure, whilst plates made the day after with spores 2 months and 21 days old, required 7 hours' exposure. Spores 10 days old showed no growth after 5 hours' exposure; and spores 5 days old, no growth after 6 hours' exposure. From a large number of determinations, the average length of exposure necessary to kill spores within the above range of temperature was found to be 5 hours.

*Vitality on various media.* The cultures seem to live longer on agar than in liquid media. The vitality of old gelatine and bouillon cultures seems to be lessened by the products of the bacilli growing in these media. The spores taken from these sources have also decreased resisting power.

*Effect of growth on reaction of media.* Ordinary bouillon becomes slightly more alkaline as growth proceeds, the presence of ammonia being detected by Nessler's reagent; but control bouillon does not give the reaction. In bouillon, with the addition of glycerine and various sugars, the acidity of the media is increased, but more in the case of glucose broth than in any other. In these experiments accurate titration was made with phenolphthalein as indicator. Cheyne tried the reaction, "making the infusions faintly alkaline, and after the growth of this organism in it, it is faintly alkaline."

*Sensitiveness to Antiseptics and Germicides.* This subject is taken up in connection with the chemical remedies used for the disease.

*Pathogenesis.* Besides being pathogenic to the larvae of bees, Cheyne has inoculated two mice and one rabbit with spore-bearing cultivations with-