ture of the room. For twelve hours no change took place; but at the end of this time A began to ferment, and the thermometer marked a distinct elevation of temperature. On the second day A was in full fermentation, and its temperature was 2.7 deg. above B and C. This disturbance continued for five days, the temperature ranging from two to three degrees above the companion bottles. The disturbance then subsided, and the temperature fell to an equality with B and C, and a considerable sediment, composed of yeast, settled at the bottom. In the meanwhile B showed little altera tion; but on the sixth day it began to ferment, the temperature went up, and for more than a week its thermometer stood about two degrees above A and c. Finally, the temperature in B declined, the disturbance subsided, and the newly-formed yeast settled to the bottom of the vessel.

The fever in a bottle resembled small-poxil, the following points :- A period of incubation intervened between inoculation and the commencement of disturbance; then followed a period of disturbance accompanied by elevation of temperature; this was succeeded by a subsidence of the disturbance and a return to the normal state. Great multiplication of the infective material (or yeast) took place during the process, and after its conclusion the liquid was protected from further infection with the same contagium. We likewise notice that the contagium of termentation, like that of small-pox, may take effect either by direct purposive inoculation or by fortuitous infection through the atmosphere. In both cases the infective material has the power of preserving its activity for an indefinite period. The comparison fails in at least one important point-in the fermented urine sugar is replaced by alcohol and carbonic acid, but we are not aware that any pronounced chemical changes occur in the blood or tissues during the attack of small-pox. I would, moreover, carefully guard myself against being supposed to suggest that the enhanced temperature in the fermenting urine is a leal analogue of the preternatural heat of fever.

Let us direct your attention to another example -1 kind of partial decomposition or fermentation which takes place in boiled hav infusion when it is inoculated with the Bacillus subtilis. The Bacillus subtilis is a very common bacterium, found in vegetable infusions and in curdling milk. I hope you will take note of this little organism; for I shall have to refer to it more than once in the course of this address. I took a flask containing hay-infusion which had been sterilised by boiling, and inoculated it with a drop of fluid swarming with Bacillus subtilis. After the lapse of twenty-four hours the previously transparent infusion became turbid. This turbidity increased, and on the second day a film or crust formed on the surface of the infusion. On the third and subsequent days, the crust broke | tures which have been rendered sterile by a sum up, and fell in pieces to the bottom of the vessel. | ently prolonged application of the heat of boll

In about a fortnight the turbidity passed away, and the origional transparency of the infusion was now a sediment consisting of the spores of the little of ganism at the bottom of the flask. In this case, again, there was the same succession of events-a period of incubation, followed by a period of dis turbance, succeeded by a period of subsidence and, finally, restoration to the normal state. There was also great increase of the infective material and immunity from further attack by the same contagi

THE CANADA LANCET.

The yeast-plant and the *Bacillus subtilis* may be taken as representatives of a large class of organ isms, in regard to which we are only beginning to realise their vast importance in the economy of Nature and in the life of man. They are as I shall presently show, the essential agents in all ferment tations, decompositions, and putrefactions. We may group them together, for the convenience of description, under the general designation of safe rophytes-a term intended to include, under on heading, all the organisms associated with the de composition and decay of organic matter. The yeast-plant and its allies, and all the numerous species and varieties of bacteria, belong to th group. In size and form, they are among the smallest and simplest of living things, but their vit endowments are wonderful.

might All the organisms hitherto found associated will away, infective inflamations and contagious fever below sealed to the tribe of bacteria, and we cannot advantage boilin ously enter on a study of that association without flask i knowledge of the origin and attributes of these of The : ganisms. This brings us into a field of active com tobac troversy. It has been alleged, as you know, on high tered. authority, that these organisms, under certain cos with. ditions, depart entirely from the universal law d draw generation, which is expressed in the aphoris flask. omne vivum è vivo, and that they may arise spon takes taneously by a process of abiogenesis. It is als a suff alleged that these organisms are not the actual move agents of decomposition, but are merely associated the p with that process as secondary or accidental accom ised. paniments, I propose to lay before you evidence the e: that both these allegations are unsustainable, and of a l to prove that bacteria, like other organisms, and aflask from pre-existing parent gems, and in no other with prote-and that they are the actual agents in all deconstruction cotto position and putrefaction. lif due

The first proposition I shall endeavour to estable ation lish is this: that organic matter has no inhere do nc power of generating bacteria, and no inhere not e power of passing into decomposition.

ThI have placed before you samples of three st pects of preparation, out of a large number in my p isist ( session, which serve to substantiate this propo iremo tion. trans

The first set consists of organic liquids and m

unglaz

include

urine,

As the

which

inches

by ind

the litt

tillatic

water,

serted

briskly

cotton

clearir

purifi

the n

you.

38

State of the second

挤

12

11

翻行

(iii) >

翻口

卿科

Bill 1

199911 12

linnu :

期時期7 话

增額用 虚

用路时 中

明朝日 (4)

ilian it:

11441-1

翻翻自

出际制 小

igean: : w

組織的いい

制裁制付 い

副新生生

關聯行标

期1 (1

鼬山

**副制作 (5** 

朝1 13

1 18:

14

約到 節